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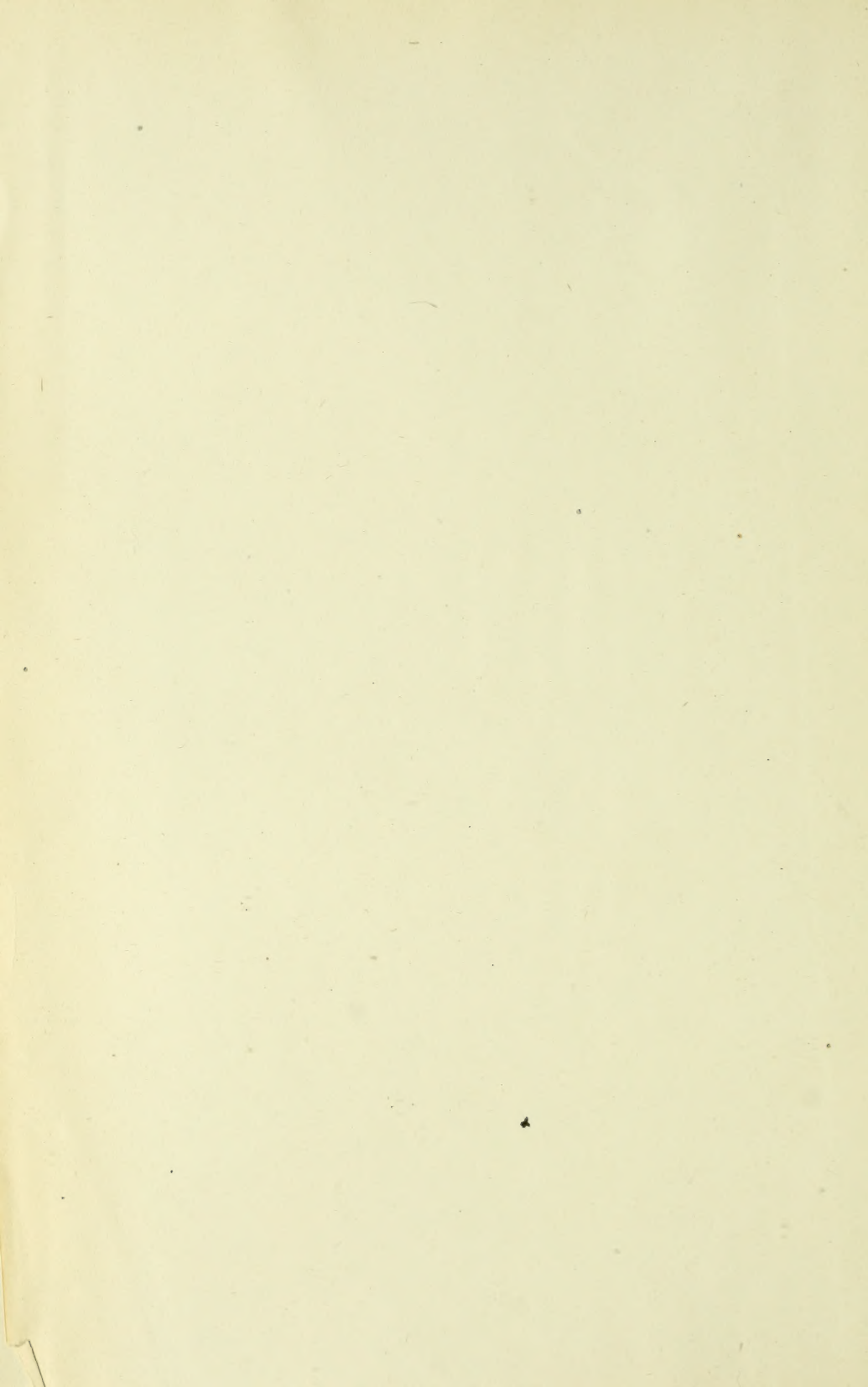
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FORTIETH ANNUAL REPORT

OF THE

Ohio State Board of Agriculture,

WITH AN ABSTRACT OF THE PROCEEDINGS OF THE

COUNTY AGRICULTURAL SOCIETIES,

FOR THE

YEAR 1885,

TO THE

GENERAL ASSEMBLY OF THE STATE OF OHIO.

COLUMBUS:

MYERS BROTHERS, STATE PRINTERS.

1886.

INTRODUCTORY.

REPORT OF THE OHIO STATE BOARD OF AGRICULTURE FOR THE YEAR 1885.

In accordance with the requirements of the law, the Ohio State Board of Agriculture herewith submits its fortieth annual report.

It embraces the various proceedings and reports that are required by law, and that have heretofore been included in the annual reports of the Board, together with certain other matters connected with its work.

On pages 1 to 80 may be found the transactions of the Board of Agriculture for the year 1885. On pages 81 to 200 will be found the report of the State Fair of 1885, being the last held on the old grounds of the Franklin County Society. On pages 201 to 215 will be found the annual statistics and reports from county societies. The first annual report of the Veterinarian, acting under the Cattle Commission, appears on pages 316-321. Lectures and papers selected from those read at Farmers' Institutes, during the winter of 1885-6, may be found on pages 325-447.

The Crop Reports have been issued about the tenth of the months of April, June, July, September, and December. The demand for these reports, including the table of analyses of fertilizers, is gradually increasing.

Farmers' Institutes were held in about forty counties during the winter, usually occupying two days and one evening, each. The work of the institutes, and of furnishing speakers by the State Board of Agriculture, greatly increases the labor of the Secretary. He was cordially and efficiently supported by the President and Faculty of the University at Columbus, and by members of the State Horticultural Society.

The work of the institutes is steadily enlarging, and counties are organizing permanent institutes, and in some counties they are held two to four times a year. The stimulus of the institutes inaugurated by the State Board of Agriculture has encouraged farmers to organize and hold other institutes than those given under the auspices of the State Board.

The Inspection of Fertilizers.—The act of March 16, 1881, making it the work of the Secretary of the State Board of Agriculture to inspect fertilizers

sold in the State, has resulted in driving out the cheap and inferior grades, and in forcing the sellers to lower the prices.

The determinations of values by Professor N. W. Lord, and the Secretary, have been accepted by the buyers as reliable guides, and have been welcomed by all manufacturers of first-class fertilizers.

About one hundred and forty brands of commercial fertilizers were sampled and analyzed.

The entire expenses of inspection and analysis, amounting to over one thousand three hundred dollars, was covered by the license fees, leaving a small balance, which will compensate the Board for the large amount of the time and labor expended in sampling, collecting, calculating values, attending to correspondence, and preparing tabulated reports, which take fully one-fourth of the time of the Secretary.

The appropriation for the encouragement of agriculture has been carefully used by the State Board of Agriculture in promoting the interests of agriculture.

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OHIO AGRICULTURAL REPORT.

TRANSACTIONS OF THE

State Board of Agriculture,

FOR THE YEAR 1885.

OFFICERS AND MEMBERS OF THE BOARD.

OFFICERS FOR 1885.

C. D. BAILEY, Gallipolis, Gallia county.....	<i>President.</i>
J. C. LEVERING, Leverings, Knox county.....	<i>Treasurer.</i>
W. I. CHAMBERLAIN, Columbus, Franklin county.....	<i>Secretary.</i>
JAS. W. FLEMING, Columbus, Franklin county.....	<i>Assistant Secretary</i>

MEMBERS FOR 1885.

C. D. BAILEY, President	Gallipolis, Gallia county.
J. C. LEVERING, Treasurer	Leverings, Knox county.
W. S. FOSTER	Urbana, Champaign county.
L. B. HARRIS	Upper Sandusky, Wyandot county.
J. H. BRIGHAM	Delta, Fulton county.
L. N. BONHAM	Oxford, Butler county.
H. TALCOTT	Jefferson, Ashtabula county.
JNO. POW	Salem, Columbiana county.
T. P. SHIELDS	Watkins, Union county.
S. H. HURST	Chillicothe, Ross county.

EXECUTIVE COMMITTEE FOR 1885.

C. D. BAILEY, <i>President</i> ,	W. S. FOSTER,	J. C. LEVERING,
L. B. HARRIS,	L. N. BONHAM.	

OFFICERS FOR 1886.

L. N. BONHAM, Oxford, Butler county.....	<i>President.</i>
L. B. HARRIS, Upper Sandusky, Wyandot county	<i>Treasurer.</i>
W. I. CHAMBERLAIN, Columbus, Franklin county.....	<i>Secretary.</i>
JAS. W. FLEMING, Columbus, Franklin county.....	<i>Assistant Secretary.</i>

MEMBERS FOR 1886.

L. N. BONHAM.....	Oxford, Butler county.
L. B. HARRIS.....	Upper Sandusky, Wayandot county.
C. D. BAILEY	Gallipolis, Gallia county.
J. C. LEVERING	Leverings, Knox county.
WM. S. FOSTER	Urbana, Champaign county.
J. H. BRIGHAM	Delta, Fulton county.
H. TALCOTT	Jefferson, Ashtabula county.
T. P. SHIELDS.....	Watkins, Union county.
JNO. POW.....	Salem, Columbiana county.
S. H. HURST	Chillicothe, Ross county.

EXECUTIVE COMMITTEE FOR 1886.

L. N. BONHAM, <i>President</i> ,	W. S. FOSTER,	J. C. LEVERING
L. B. HARRIS,	C. D. BAILEY,	

LIST OF THE MEMBERS OF THE OHIO STATE BOARD OF AGRICULTURE,

FROM THE FIRST STATE FAIR TO THE YEAR 1884.

[Members are elected to serve two years. The Board consists of ten members; the term of service of five expires annually.*]

Name.	Years of service, inclusive.	Post-office.
M. L. Sullivant†.....	1850-53	Columbus.
S. Medary†.....	1850-53	Columbus.
M. B. Bateham†.....	1850	Painesville.
D. Lapham†.....	1850	Cincinnati.
F. R. Elliott.....	1850-51	New York.
J. T. Pugsley.....	1850-51	Convenience.
Arthur Watts†.....	1850-52	Chillicothe.
J. M. Edwards.....	1850-52	Youngstown.
C. Springer†.....	1850-52	Meadow Grove.
J. G. Gest.....	1850-54	Xenia.
S. Halloway.....	1851	St. Clairsville.
Allen Trimble†.....	1850-51	Hillsborough.
William Case†.....	1852-53	Cleveland.
Philo Adams†.....	1852-53	Huron.
B. W. Musgrave†.....	1852-57	Sulphur Springs.
R. W. Steele.....	1853-56	Dayton.
William H. Ladd.....	1853-56	Brooklyn, N. Y.
D. McIntosh.....	1853-54	Shalersville.
J. T. Worthington†.....	1853-56	Chillicothe.
Joseph Sullivant†.....	1854-55	Columbus.
John K. Greene.....	1854-57	Cincinnati.
James L. Cox.....	1854-55	Zanesville.
B. Stedman†.....	1854-57	Washington, D. C.
Alexander Waddle†.....	1855-60	South Charleston.
Abel Krum.....	1855-58	Cherry Valley.
Lucien Buttles†.....	1856-59	Columbus.
G. W. Barkert†.....	1856-57	Marietta.
John M. Millikin†.....	1857-62	Hamilton.
Luther Smith.....	1857-58	West Liberty.
Thomas S. Webb.....	1857-58	Massillon.
Norton S. Townshend†.....	1858-63	Avon.
L. Q. Rawson.....	1858-59	Fremont.
James M. Trimble†.....	1858-61	Hillsborough.
John Rebert.....	1858-61	Lancaster.
D. E. Gardner†.....	1859-64	Toledo.
William Dewitt.....	1859-64	Cleveland.
C. W. Potwin.....	1859-62	Zanesville.
T. C. Jones.....	1860-67	Delaware.
Henry B. Perkins.....	1860-63	Warren.
David Taylor.....	1861-66	Columbus.
Jacob Egbert†.....	1862-63	Lebanon.
Nelson J. Turney†.....	1862-69	Circleville.
D. McMillan†.....	1863-70	Xenia.
W. R. Putman.....	1863-64	Marietta.

MEMBERS OF THE STATE BOARD OF AGRICULTURE—Concluded.

Name.	Years of service, inclusive.	Post-office.
William F. Greer†.....	1864-67	Painesville.
James Fullington.....	1864-69	Irwin Station.
William B. McClung†.....	1864-71	Troy.
James W. Ross||.....	1865-70	Perrysburg.
R. R. Donnelly†.....	1865-68	Wooster.
James Buckingham.....	1865-72	Zanesville.
J. Park Alexander.....	1867-70	Akron.
Norton S. Townshend†.....	1868-69	Avon.
William Lang.....	1868-71	Tiffin.
D. C. Richmond.....	1869-74	Sandusky.
R. P. Cannon.....	1870-75	Aurora.
James B. Jamison.....	1860-77	Cadiz.
L. G. De-lano.....	1870-75	Chillicothe.
L. B. Sprague.....	1871-76	Springfield.
Simpson Harmount.....	1871-76	New Philadelphia.
John A. Warder†.....	1871-76	Cleves.
W. S. Hickox.....	1872-73	Mansfield.
B. W. Carlisle.....	1872-79	Hooker's Station.
Justus C. Stevens.....	1873-74	Kenton.
John M. Pugh.....	1874-79	Columbus.
L. B. Wing.....	1875-80	Newark.
Russell C. Thompson†.....	1875-76	Sylvania.
Leo Weltz.....	1876-84	Wilmington.
D. L. Pope.....	1876-81	Welshfield.
Chas. Smith.....	1877-80	Marion.
E. T. Stickney.....	1877-78	Republic.
A. E. Stone.....	1877-78	Gallipolis.
Peter Murphey.....	1877-80	Hughes' Station.
W. N. Cowden.....	1878-84	Quaker City.
R. Baker.....	1879-82	Elyria.
Arvine C. Wales†.....	1879-82	Massillon.
R. H. Hayman.....	1880-81	Portsmouth.
O. P. Chaney.....	1880-82	Canal Winchester.
C. D. Bailey.....	1881	Gallipolis.
J. C. Levering.....	1881	Leverings.
Wm. S. Foster.....	1881	Urbana.
L. B. Harris.....	1882	Upper Sandusky.
J. H. Brigham.....	1882	Delta.
L. N. Bonham.....	1883	Oxford.
H. Talcott.....	1883	Jefferson.
N. A. Sims.....	1883-84	Columbus.
T. P. Shields.....	1884	Watkins.
John Pow.....	1884	Salem.
S. H. Hurst.....	1884	Chillicothe.

* The old members were re-elected in 1885 and in 1886; no change being made in the Board.

† Deceased.

‡ Removed to Columbus.

|| Removed to Caldwell, Kansas.

TABLE SHOWING THE PLACE AND RECEIPTS OF EACH STATE FAIR HELD; ALSO A LIST OF THE OFFICERS OF EACH YEAR OR FAIR.

Year.	President.	Treasurer.	Secretary.	Place of Fair.	Receipts.
1850.....	M. L. Sullivant*	Samuel Medary*	M. B. Bateham*	Cincinnati	\$8,096 18
1851.....	same	same	W. W. Mather.	Columbus	8,204 09
1852.....	Arthur Watts*	same	same	Cleveland	13,360 00
1853.....	Samuel Medary*	M. L. Sullivant*	George Sprague	Dayton	13,996 37
1854.....	R. W. Musgrave*	Joseph Sullivant*	same	Newark	8,824 58
1855.....	J. T. Worthington*	same	same	Columbus	9,745 54
1856.....	William H. Ladd	Lucien Buttes*	same	Cleveland	16,684 20
1857.....	Alexander Waddle*	same	John H. Klippart*	Cincinnati	17,580 75
1858.....	John M. Millikin*	same	same	Sandusky	9,997 70
1859.....	N. S. Townshend	same	same	Zanesville	9,958 83
1860.....	Alexander Waddle	Charles T. Potwin	same	Dayton	11,498 50
1861.....	Darwin E. Gardner*	same	same	"	8,636 18
1862.....	Thomas C. Jones	David Taylor.	same	Cleveland	11,260 64
1863.....	N. S. Townshend	same	same	"	11,142 09
1864.....	Nelson J. Turney*	same	same	Columbus	12,620 54
1865.....	same	same	same	"	10,658 65
1866.....	Wm B. McClung	same	same	Dayton	14,035 80
1867.....	Daniel McMillan*	James Buckingham	same	"	18,692 98
1868.....	James Fullington	same	same	Toledo	15,606 25
1869.....	same	same	same	"	19,606 50
1870.....	James W. Ross.	J. Park Alexander	same	"	18,252 25
1871.....	William Lang	James Buckingham	same	Springfield	16,480 25
1872.....	James Buckingham	Simpson Harmont	same	"	19,149 45
1873.....	Lincoln G. Delano	same	same	Mansfield	22,517 50
1874.....	same	same	same	"	27,674 79
1875.....	R. P. Cannon	same	same	Columbus	20,539 30
1876.....	S. Harmont	J. M. Pugh	same	"	11,909 61
1877.....	J. B. Jamison	same	same	"	21,151 91
1878.....	John M. Pugh	L. B. Wing	same	"	11,979 50
1879.....	B. W. Carlisle	same	Ias W. Fleming, Acting	"	30,703 35
1880.....	L. B. Wing	same	W. I. Chamberlain	"	23,682 20
1881.....	D. L. Pope	Leo Weltz	same	"	29,706 16
1882.....	R. Baker	W. N. Cowden	same	"	34,082 52
1883.....	W. N. Cowden	L. B. Harris	same	"	35,513 78
1884.....	W. S. Foster	same	same	"	33,306 48
1885.....	C. D. Bailey	J. C. Levering	same	"	29,796 51

Deceased.

TRANSACTIONS OF THE OHIO STATE BOARD OF AGRICULTURE FOR THE YEAR 1885.

STATE AGRICULTURAL ROOMS, *January 14, 1885—9 P.M.*

The new Board organized by electing officers as follows: President, C. D. Bailey, of Gallipolis; Treasurer, J. C. Levering, of Leverings; Secretary, W. I. Chamberlain, of Columbus; Assistant Secretary, Jas. W. Fleming, of Columbus.

Frank Fleming was appointed Clerk at \$50.00 per month. The salary of the Secretary was fixed as before, at \$2,000 per annum, and that of the Assistant Secretary at \$1,500 per annum. It was

Voted, That the next State Fair be held August 31 and September 1, 2, 3 and 4, 1885, and that the Secretary notify county societies of the dates.

Adjourned to 9 a.m. of the 15th.

JANUARY 15, 1885—9 A.M.

Board met, with President Bailey in the chair. It was

Voted, That a Committee on Legislation be appointed by the President, consisting of four, including the President.

The committee was appointed as follows: Messrs. Bailey, Foster, Brigham and Levering.

The Executive Committee was authorized to purchase the Monett and the Dow houses and lots projecting into the Fair Grounds, at not more than \$2,000. It was

Moved, to suspend the landscape gardening work until spring, so soon as the rest of the large trees along the Main avenue are set, and the motion was referred to the Executive Committee. It was

Voted, That Assistant Secretary Fleming see to the transfer of the deeds for the New Fair Grounds from W. N. Cowden and L. B. Harris, Trustees in Trust, to the Ohio State Board of Agriculture; also, that he pay any unpaid taxes on the grounds. It was

Voted, That the secretaries take the necessary steps to secure the opening of Eighth street (Harbor road) northerly in a straight line to the New Fair Grounds from Fifth avenue. It was

Voted, That the Treasurer be instructed to make arrangements at P. Hayden & Co.'s Bank for the necessary temporary over-draft until other provision is made for funds.

The bonds of officers were fixed as heretofore, viz.: Treasurer's bond, \$25,000; Secretary's bond, \$10,000; Assistant Secretary's bond, \$5,000. The bonds to be approved by the Board, and held by the President.

A new edition (500 copies) of the rules for county societies was ordered printed and sent to county societies; the changes recommended by vote of the

Annual Convention, January 14, 1885, to be printed in italics with a note calling attention to the changes. The rules are as follows :

I. The Board of Directors for the management of County and District Societies shall consist of not less than ten members, whose term of office shall be two years, and until their successors are elected. The tenure of office shall be so arranged that the term of one half of the members of the Board of Directors shall expire annually.

II. The Board of Directors, at its first meeting after the annual election, shall organize by the election of a President, Vice President, Treasurer and Secretary, whose term of office shall be one year, and until their successors are elected. Only members of the Board of Directors shall be eligible to the office of President and of Vice President. Any member of the Society shall be eligible to the office of Secretary and Treasurer.

III. On the last *Saturday of January, annually, unless otherwise prescribed by the constitution of the society, or by special legislative enactment*, an election shall be held to select one-half the members of the Board of Directors, whose term of office shall be for two years *from date of election*. Only bona fide members of the society shall be entitled to vote. Candidates for members of the Board of Directors must be members of the society.

IV. The Secretary shall give the members of the society due notice of the time and place (room or hall) of the election, and the hours at which the polls will open and close, three weeks prior to the election, in at least two papers of general circulation in the county; at the closing of the polls, the counting of the ballots shall be proceeded with, as may be agreed upon by the Board. Candidates shall be privileged to witness the count, either in person or by substitute.

V. Members of the society must be residents of the county or district, must be over twenty-one years old, and must annually pay not less than the sum of one dollar to the Treasurer.

VI. The Secretary shall keep a list of the members of the society, so that he may be able to report to the State Board the number of members each year, and so that it may be ascertained who are entitled to vote for officers.

VII. County or district societies may open their premium lists to all persons, without restriction, except on field crops, which shall be confined to the county or district.

VIII. All articles offered for premiums must be owned by the person offering the same, or by some member of his or her family.

IX. Awarding committees must comply with the provisions of the law requiring competitors for premiums on crops and other improvements to furnish full and accurate statements of the process, expense of culture, production, etc.

X. Competitors for premiums on crops shall be required to have the ground and its products accurately measured, and satisfactory proof, under oath, must be furnished by each competitor.

XI. Each society shall have duly prepared an annual report, and shall present the same to the State Board of Agriculture on or before the annual meeting of said board, as prescribed to be held by the sixth section of the "act for the encouragement of agriculture." (See Section 3692, Revised Statutes of Ohio.)

XII. Said report shall contain the following—

1. A list of the premiums awarded at the previous annual fair.

2. A copy of the published abstract of the Treasurer's account, as the same was published in conformity with the third section of the above named law.

3. All statements of competitors for premiums on crops or other improvements in agriculture, detailing mode of tillage, etc., etc.

4. A general account of the proceedings of the society, the number of its members, and the prospects of its progress and usefulness.

5. A statement of the principal crops raised in the county or district; an estimate of the amount of each raised; the average yield per acre; the striking characteristics of the previous season; the names of the destructive insects which may have injured crops; and such other facts as will tend to give a full view of the state of agriculture in each county or district, so that the same may be embodied in the succeeding annual report, made by the State Board to the Legislature.

XIII. The Secretary of every county agricultural society which receives money from the county treasury shall cause the official proceedings of the society to be published in some newspaper of general circulation in the county.

The Treasurer of every county agricultural society which receives money from the county treasury shall, annually, file with the auditor of his county a detailed statement, showing the receipts and disbursements of the society for the preceding year; and until such report is so filed, and Sec. 3699 of the Revised Statutes of Ohio complied with, no money shall be paid out of any county treasury to any County or District Agricultural Society.

NOTE.—The above rules were discussed in Annual Convention, January 14, 1885, and certain changes in the "Third Rule" were by vote unanimously recommended. These changes are indicated by *italics* above, and the rules, as amended, were unanimously adopted by the State Board of Agriculture, January 15, 1885, and hence are now of binding force on all county societies.

The Secretaries were ordered to approve designs for and secure new colored lithographs (window hangers) for the State Fair of 1885.

STATE AGRICULTURAL ROOMS,
COLUMBUS, *March 3*, 1885—9 O'CLOCK A.M.

The Board met, pursuant to the call of the President.

The minutes of the previous meeting were read and approved, and the *ad interim* report by the Secretary received and placed on file.

On motion of Mr. Foster, the Secretary was directed to correspond with the U. S. Commissioner as to the efficiency of the crop reporting system in Ohio and ask his endorsement, if approved.

The premium list was then taken up for revision.

Messrs. Mitchell and Hoover, as a committee from the Jersey Cattle Breeders' Association, appeared before the Board and presented the following resolution, adopted by that association:

Resolved, That this association offer a silver cup, suitably engraved, for the best Jersey bull with five of his get, under three years old, to be bred and owned by the exhibitor, a resident of the State of Ohio. The cup to be awarded at the Ohio State Fair, in 1885.

Also, a silver cup, suitably engraved, for the best Jersey cow owned in the State of Ohio, making the largest amount of butter in seven consecutive days within the year 1885, and previous to September 1, 1885. The test to be witnessed by at least one responsible person besides the owner of the animal, a copy of said test to be forwarded to the secretary of this association, and to be

made on blanks to be furnished by this association, which shall state age of cow, number of calves she has had, the date of last calf, the amount in pounds and ounces of food consumed and the kind of food; if on grass, the kind; also, the amount of milk and butter.

On the recommendation of the same association, it was

Agreed, That expert judges be appointed to pass upon the Jersey class at the next State Fair; such judges to be selected from names submitted to the Board by said Jersey Association.

The revision of the premium list was continued until nearly noon, when it was suspended, for the time being, to hear Mr. Milton Pierce, of Philadelphia, on the subject of carp culture and the propriety of establishing in Ohio a commission of experts, to give instruction in the construction of ponds and the propagation of carp.

On motion, a recess was taken until 1:30 p.m., at which hour the Board re-assembled and proceeded to business.

On motion of Mr. Pow, the matter of establishing a carp pond on the State Fair grounds was referred to the Secretaries, with authority to expend not to exceed \$50 00.

On motion, the arrangement of premiums in the educational department was referred the same as last year.

Messrs. Harris, Levering and Fleming were appointed a committee to report to the Board on the character of tickets for the ensuing fair.

On motion of Mr. Foster, it was

Ordered, That in the matter of printing for the State Fair, the Secretaries receive proposals and award to the lowest bidders.

On motion of Mr. Levering, the advertising was referred to the Secretaries, with instructions to keep the cost within the amount expended last year.

On motion of Mr. Foster, the sale of State Fair privileges was referred to the Assistant Secretary, with instructions to sell to the best advantage and under the proper restrictions, the same character of privileges as have been heretofore sold, except that no privilege shall in any way be sold or granted for the selling of beer on the fair grounds.

The selection and engagement of bands for the Fair was referred to the Secretaries.

The bonds of the Treasurer, Secretary and Assistant Secretary, in the sums of \$25,000, \$10,000 and \$5,000, respectively, were presented and accepted.

Recess until 7:30 p.m., at which hour the Board again assembled and completed the revision of the premium list, as per published copy.

On motion of Mr. Foster, the holding of a trial of ditching machines was referred to the Executive Committee.

The Committee on tickets submitted the following report:

Your committee recommend for admission tickets as follows:

1st. That there be issued but two kinds of complimentary tickets: the full complimentary and a single ticket, good for but one admission.

2d. That the tickets to crop correspondents and threshermen be the same, except that the correspondent's ticket contain four coupons and the thresherman's ticket two coupons, each coupon to admit one person any day.

3d. Members blank passes for grooms and employes same as last year.

4th. Exhibiter's tickets same as last year and under same regulations.

5th. Percentage tickets same as last year.

L. B. HARRIS,
J. C. LEVERING,
JAS. W. FLEMING,
Committee.

On motion of Mr. Hurst, the Board's bonds to the amount of \$25,000 were ordered executed and placed in the hands of the Treasurer for negotiation.

On motion of Mr. Foster, it was

Ordered, That the land contract with H. T. Chittenden be now fulfilled by delivering to Mr. Chittenden the bonds, as agreed.

Ordered, That the Treasurer and Secretary effect, if possible, an arrangement with the parties holding \$2,000 note, due April 1, 1885, for a continuance of the same, or the acceptance of bonds in payment.

On motion of Mr. Foster, it was

Agreed, That the Board should buy one share of stock in the American Shorthorn Record Association, and that the Board also become a member of the National Cattle Growers' Association of America, the fees to be forwarded by the Secretary.

The Secretary was directed to correspond relative to the purchase of a road machine and report to the Executive Committee at its next meeting.

On motion of Mr. Pow, the Secretary was invited to accompany the Board, or as many of the members as should go, to New Orleans.

Adjourned to meet Wednesday, 9 o'clock a.m.

The Board met Wednesday morning.

The minutes of the previous day were read and approved.

On motion, it was

Agreed, To petition the United States Commissioner of Agriculture to retain W. I. Chamberlain as State Statistical Agent for Ohio.

On motion, it was

Agreed, That the Governor of Ohio, Hon. Geo. Hoadly, be urged to appoint as Trustee of the Ohio State University, next May, some one who is known to be in sympathy with, and to represent the agricultural and industrial interests for the benefit of which, largely, the Congressional land grants were made, by which the University is endowed.

On motion, adjourned to meet at the call of the President.

AGRICULTURAL ROOMS, April 8, 1885.

The Executive Committee met pursuant to the call of the President.

The minutes were read and approved.

The ad interim report was read and ordered placed on file as usual. It was

Voted, Not to purchase the Darling road machine at the offer of \$210.

Governor Hoadly's response to the request of the Board in regard to the appointment of some one representing the agricultural and mechanical interests of State on the Ohio State University Board of Trustees was read, and the Secretary was instructed to acknowledge the courtesy shown by and in the letter, and to say that the Board can see the force of the views expressed in it as the reason for not complying fully with the request.

In response to numerous requests for lectures by the Secretary during the summer, he was authorized to excuse himself from accepting any invitations, because the other work of the Board is so pressing in summer time. It was

Voted, That the trial of ditching machines be postponed until fall (probably October). Time to be named hereafter.

The Secretaries were instructed to secure an amendment to the law authorizing the issue by the Board of bonds for Fair Grounds improvements for \$80,000, or less, so as to make them mortgage bonds, secured by mortgage on the new grounds and improvements.

The Secretaries and Mr. Harris were made a committee to ascertain the proper form and manner of issuing the said mortgage bonds.

Recess.

APRIL 9, 1885, 9 O'CLOCK A. M.

The Board met and adopted the following statement prepared by the Secretary, under instructions, as the statement of the grounds on which the Board asks an appropriation of \$15,000 to aid in improving the Fair Grounds; after which the Executive Committee appeared before the Finance Committee of the Senate, and presented it through the Secretary as follows:

To the Finance Committee of the Senate:

GENTLEMEN.—We ask a special appropriation of \$15,000 to aid in erecting buildings and making other improvements on the New State Fair Grounds purchased by the Board of Agriculture, and located one and three quarter miles north of the Union depot, Columbus, on the line of the Cleveland, Columbus, Cincinnati and Indianapolis railway. We ask it for the following reasons:

It seems to us legitimate. It is not in any sense class legislation. The State Fair is held in the interests of all the productive and commercial classes of the State. It is urged that it is more especially in the interests of the farmers, it is only fair to remember also that the farmers of Ohio pay taxes on half the property and cast half the votes in the State, while in the United States at large the farmers pay taxes (by the census of 1880) on 72 per cent. of the entire taxable property, real and personal.

Again, similar appropriations are sanctioned by law and made by the county commissioners in many counties to aid in the purchase and improvement of county fair grounds, in addition to the regular annual appropriation. It can hardly be said that the State Fair is less worthy or less in need of aid than the county fairs.

The State Board is required by law to hold a State Fair annually. For thirty years of its history the Fair was migratory, moving from place to place. This was perhaps a necessity then, but it made it impossible for the State Board to accumulate a dollar's worth of real and tangible property for the State. Under changed conditions and with increased railway facilities, a permanent location seemed advisable, and four years ago the migratory system was definitely and finally abandoned by a lease of the Franklin County Fair Grounds, and a vote and agreement to hold the Fair at Columbus for a term of not less than twenty five years. Two years ago the coming fall, for what seemed good reasons, new Fair Grounds were purchased by the Board, to be forever the property of the State. The wisdom of this purchase, we think, is now unquestioned.

Inasmuch as the Board is required by law to hold a State Fair annually, a permanent and suitable place to hold it seems not only a necessity, but a legitimate subject for legislative aid. The State Board is not a private corporation for purposes of gain. Its ten members serve wholly without compensation. Whatever they make from the Fair belongs to the State, and not to them or to any one of them individually. It is true they have often voluntarily become responsible individually and collectively at bank for funds to pay premiums and expenses of the Fair in years of bad weather and reverse to the Fair, but they have never shared, and can not share, the profits of success. It seems

unwise for the State to withhold needed means and yet require the Board to do a specific work for the public good.

Second.—This appropriation is needed. The entire surplus earnings for the past two years and more have been exhausted in the purchase and partial improvement of ninety acres of land for Fair Grounds, and the appropriation is urgently needed, in addition to what we can raise by the bonds we are authorized to issue (but which we have not yet been able to negotiate because capital is cautious), to enable the Board to fit up grounds that shall be a worthy place to represent and exhibit the productive interests of the great Commonwealth of Ohio.

Third.—The sum asked is small. It would be entirely insignificant on the grand duplicate, would average not five cents each to the tax payers, and not one-half cent each for the population. It is small, too, as compared with many appropriations for temporary matters—annual expenses or special matters, not permanent real estate improvements like this. Small, too, if compared with the appropriations for permanent improvements or special expenses, as for example, the State University, the Penitentiary, the Imbecile and other asylums. It can hardly be said that the productive classes have less right to necessary legislative aid than the unfortunate, the criminal, the non-productive classes.

Fourth.—The tax-payers favor and ask this appropriation. In proof of this we present to you petitions from every county in the State, signed by over ten thousand men who are both voters and tax payers, and by none others. They were sent in by our correspondents, who unite in saying that the lists might be enormously increased. This is one of the few appropriations that will meet the general approval of tax payers.

Fifth.—The usual annual appropriation can hardly be considered as an aid to the Fair. More than three-fourths of the time of the secretaries and the expenses of the office paid from this annual appropriation are expended in other directions, in work that brings no cash return to the Board, such as farmers' institutes, monthly crop reports, annual statistical work, fertilizer inspection and analysis, and other work for the common good, that would cost the State the entire annual appropriation if committed to a separate Board as in some other States.

Sixth.—The appropriation, if made, will be wisely expended in improving the grounds. A sufficient guarantee for this is the history of the State Board of Agriculture for the past forty years, since first it was created by law and placed in charge of the agricultural and productive interests of the State. There has never been, we believe, a blot upon its good name, or a question of its financial integrity, or its wise management of the concerns committed to it. We have never wearied the Legislature nor its committees with unnecessary appeals for aid. We have never asked for what we did not urgently need for the success of the work committed to us, or for more than the exact sum we have needed, and I believe we have never, at least not in recent years, failed to receive from the Legislature whatever we have asked.

STATE AGRICULTURAL ROOMS,
COLUMBUS, May 20, 1885.

The Board met pursuant to the call of the President.

The minutes of the preceding meeting were read and approved.

The ad-interim report of the Secretary was read and placed on file.

On motion of Mr. Foster, it was

Agreed, To draw upon the \$15,000 State appropriation for State Fair improvements, as the latter shall be made.

On motion of Mr. Bonham Mr. E. K. Stewart, of Columbus, was nominated to act as Trustee for the bondholders in the case of the first mortgage bonds to be issued by the Board, under act of the Legislature, May, 1885, and the Secretary was instructed to notify Mr. Stewart of his nomination, and request his acceptance.

On motion of Mr. Foster, it was

Ordered, That the total issue of the first mortgage bonds, under the law authorizing them be \$60,000, and that the time and manner of issue be referred to a committee consisting of the President, Treasurer and Secretary, who shall act also in the matter of negotiating the bonds, and providing that \$20,000 be issued July 1, 1885, and \$10,000 per month thereafter until the full quota is issued.

On motion of Mr. Bonham, it was

Ordered, that the bonds to be issued be called in the inverse order of their issue, and at a rate not to exceed \$5,000 per year, and no bond to be called within five years from the date of issue.

The President, Treasurer and Secretary were constituted a committee to arrange for the taking up of mortgages now on the grounds, in order to make the same clear of incumbrance, preparatory to the issuing of bonds.

On motion, the Secretary was instructed to institute measures for inducing the manufacturers of agricultural implements, to locate, after the next fair, their exhibition buildings on the new grounds, subject to such regulations as may be adopted by the Board.

The Secretary was authorized to take the necessary steps for inaugurating a system of inter-state monthly crop and stock reports.

On motion of Mr. Bonham, amended by Mr. Hurst, the Secretary was instructed to ascertain upon what terms Messrs. Terrell & Morris would consent to act as architects for the Board in the construction of buildings on the new grounds, and to report at the evening session.

On motion of Mr. Bonham, it was

Ordered, That two wells be sunk on the grounds at points convenient for present use.

On motion of Mr. Bonham, the Secretary was instructed to notify Mr. H. T. Chittenden that the Board object to his making a detour or curve in the extension of Woodward avenue, from Summit street to the grounds, it being the understanding of the Board that the spirit of the contract made with Mr. Chittenden for the extension of said avenue, is that it should be extended in a rect line.

On motion of Mr. Levering, the Secretaries were instructed to take the necessary legal steps for establishing the road, fronting the fair grounds on the north, as a regular county road, 60 feet in width, from the C., C., C. & I. Railway to the Lockwin road; and when such steps shall have been taken, to notify the President that a meeting of the Executive Committee may be called to take such further action as may be necessary in the case.

On motion, the Secretaries were directed to correspond with Col. J. H. Prague, of Norwalk, O., relative to the establishment of a post-office on the fair grounds, to be operated during the holding of the annual fairs.

On motion of Mr. Bonham, it was

Agreed, That if, after having the estimate of cost, the Board has the means, it proceed this season to erect the grand stand, horse stalls, cattle, sheep and swine buildings, power hall and dwelling house.

On motion of Mr. Bonham, it was

Ordered, That arrangements be made by the Secretary for securing, if practicable, the manure on the old grounds, collected on account of the fair, for use on the new grounds, and on motion of Mr. Foster, the Secretary was authorized to contract for the manure from the north High street car stables at the prices named by Mr. Stewart, treasurer of the car company, viz., \$75 for the year.

Recess until 7:30 p.m., when the Board re-assembled.

Messrs. Terrell & Morris, architects, appeared before the Board, by invitation, to consult relative to architectural work in connection with improvements to be made on the grounds.

On motion of Mr. Foster, Terrell & Morris were appointed architects for the Board at the terms proposed by them, viz., \$3,000, for the entire work of furnishing plans and specifications, superintending the construction of buildings and performing all other duties as architects in connection with each and the several buildings to be erected on the fair grounds, amounting to about \$120,000, or a pro rate of that amount for such proportion as may be erected.

The plans for the following buildings were submitted by the architects, corrected as noted on the plans, and adopted: grand stand, horse stalls, cattle, sheep and swine buildings, and the power hall.

Adjourned to meet Thursday morning at 8 o'clock.

Thursday morning the Board met, as per adjournment.

On motion of Mr. Foster, the Secretaries were directed to contract with Field & Fletcher for the construction of a tubular well on the new grounds, conditioned that they agree to furnish a permanent supply of water and set pump and platform complete, the whole at \$2 00 per foot for the actual feet dug or drilled. The well to be located by the Secretary and the Landscape Gardener.

On motion, the Board extended to the Live Stock Commission and to the Forestry Bureau of the State the use of our library and office for the holding of their necessary meetings.

Adjourned, to meet at the call of the President.

STATE AGRICULTURAL ROOMS, COLUMBUS, O., *June 25, 1885.*

The Board met, pursuant to the call of the President.

The minutes were read and approved. The *ad interim* report was read and laid on the table for action before the close of the meeting. It was

Voted, That Wm. Clark, our Superintendent, be instructed to ship the Darling road machine so soon as Mr. Darling shall send shipping instructions. It was

Voted, That the Secretaries arrange or pay the Cassiday mortgage at once (due April 1, 1886,) and have the record canceled. Also, that the Atcheson mortgage, due July 6, be paid at once and the record canceled. It was

Voted, That 20 surface water grates be bought of the Columbus Machine Company for the new Fair Grounds, the like patterns submitted, and with changes indicated by H. Haerlin, our Landscape Gardener, and on the terms proposed in the following offer:

COLUMBUS, OHIO, *June 25, 1885.*

To State Board of Agriculture, City:

GENTLEMEN: We hereby propose to make the grate and frame castings for 2½ cents per pound. No charge will be made for altering patterns.

Respectfully,

COLUMBUS MACHINE COMPANY.

On motion of Mr. Foster, it was

Voted, That a reporter be appointed for the Farm Product Hall Department, and Mr. Pow named Wm. B. Alwood.

Recess until two p.m.

It was

Ordered, That the Secretaries advertise for sealed bids for hay and straw for State Fair as heretofore, and accept the best bids if satisfactory. Also, that the Secretaries engage bands as heretofore, two for Tuesday, Wednesday and Friday, and three for Thursday, at \$40.00 and dinners per day, or \$70.00 and dinners for two days. It was also

Ordered. That the annual dues be paid the National Trotting Association, and our claim of \$125, on account of premiums to J. R. Hall collected by National Trotting Association, against the Association be adjusted by Assistant Secretary Fleming as soon as sufficient funds due them shall be in his hands. It was

Voted, That the names of awarding committees be published.

The live stock reporters were continued this year at \$20.00, provided they furnish acceptable and instructive reports, and the same for the reporter on farm products. It was

Voted, That the offer of the local agent of the Howe scales be accepted, viz.: That he will furnish a set of 6 ton scales to the Board for Fair this year, provided the Board buy a set at wholesale rates to agents, next year for the new grounds.

The committee consisting of the President, Treasurer and Secretary of the Board heretofore appointed to act in the matter of negotiating the bonds authorized to be issued by the Board made a verbal report recommending the passage by the Board of the following resolutions:

Resolved, First—That the Ohio State Board of Agriculture, for the purpose of improving the Ohio State Fair grounds, owned by it. and erecting buildings thereon, deem it expedient and necessary to borrow upon the credit of the Board, and its property, the sum of sixty thousand dollars, under the authority of the act of the General Assembly of the State of Ohio, passed May 1, 1885, entitled an act to amend an act entitled an act to authorize the Ohio State Board of Agriculture to issue bonds for fair grounds improvements, passed April 10, 1884.

Resolved, Second—That in order to effect such loan there be prepared for issue and negotiation one hundred and twenty bonds of the Board to be numbered consecutively from one to one hundred and twenty, to be sealed with its corporate seal, to be signed by its President, and countersigned by its Treasurer, and duly authenticated by the certificate of the Trustee named in the mortgage deed to be executed to secure the payment thereof; each of said bonds to be for the sum of five hundred dollars, bearing date July 1, A.D. 1885, payable to Edward K. Stewart, Trustee, or to the bearer thereof, at any time after five years and within twenty years from their date, at the pleasure of this Board, with interest thereon from the first day of July, A.D. 1885, at the rate of six per cent. per annum, payable semi-annually on the first days of January and July successively each year until the principal is paid, for the several instalments of which forty coupons, each for the sum of fifteen dollars, shall be executed to be attached to each of said bonds, signed by the Treasurer of this Board, both principal and interest payable at the office of this Board, in the city of Columbus, Ohio; that all of said bonds shall be sold in consecutive numbers, beginning with number one, and shall be called for redemption in the inverse order of their issue, and that not more than five thousand dollars of the issue shall be called during any year except during the year 1905.

Resolved, Third—That for the purpose of securing the payment of the said bonds, and the interest thereon, a mortgage in the nature of a conveyance in trust be duly executed by this Board to Edward K. Stewart, conveying to him, his heirs, successors and assigns in trust, for the purpose aforesaid, all the real estate, lands and tenements, situate in Franklin county, Ohio, owned and held by this Board in fee simple, and known generally as the Ohio State Fair Grounds, as the same are described in the conveyances thereof to the Board by W. N. Cowden and Lovell B. Harris, as trustees in trust for the Ohio State Board of Agriculture, by deed dated May 5, 1885, by Henry T. Chittenden and wife, by deed dated May 17, 1884, and by Abraham Dow and wife, by deed dated June 1, 1885, and by Joseph Monnett and wife, by deed dated June 1, 1885, conditioned to be void upon full payment of said bonds and coupons, and with such other and further conditions, stipulations and provisions, as are usual in like instruments, and as the President of this Board, by executing said instrument, shall adopt and approve. Said mortgage shall be executed by the President of this Board, signing thereto the corporate name and affixing the corporate seal of this Board, and attested by the Secretary of the Board, and acknowledged in due form of law in the name and on the behalf of this Board by the President and Secretary thereof, and be delivered to the Trustee therein named to hold for the benefit of all persons or corporations who may become owners of said bonds. Said mortgage or deed of trust shall also embrace the warrant of attorney of this Board, irrevocable, by which whenever default shall be made in the payment of said bonds or interest for six months after due, this Board shall authorize any lawful attorney of the State of Ohio to enter its appearance without process in a court of competent jurisdiction in said State to a petition filed by said trustee for a foreclosure of said mortgage and sale of said premises, consenting thereto or to the appointment of a receiver therein, and to waive all errors, exceptions, appeals and petitions of error therein.

On motion the above resolutions, recommended by the committee for adoption, were unanimously adopted by the Ohio State Board of Agriculture.

In accordance with the resolutions of this Board heretofore passed (see above) the President and Secretary having caused to be prepared a mortgage or deed of trust to Edward K. Stewart, as Trustee, to secure the one hundred and twenty bonds about to be issued, now produced it, and the same having been read was approved, ratified and confirmed in all its conditions, covenants and stipulations by the Board, and ordered to be executed and delivered by said President and Secretary as heretofore determined by the Board.

The mortgage was also ordered by the Board to be copied in full in its records, and is as follows:

COPY OF MORTGAGE TO E. K. STEWART, TRUSTEE.

This indenture, made this, the first day of July, A. D. 1885, between Ohio State Board of Agriculture, a corporation duly incorporated and existing by and under the laws of the State of Ohio, party of the first part, and Edward K. Stewart, Trustee, of the city of Columbus, Franklin county, Ohio, party of the second part, witnesseth:

WHEREAS, The said Ohio State Board of Agriculture, party of the first part, hath duly and legally determined to borrow money for improving its State Fair Grounds by means of an issue and sale of its bonds, to the amount of sixty thousand dollars, which should be secured by a mortgage or deed of trust, conveying the State Fair Grounds now owned by said Board, and hereinafter described, to the party of the second part, in trust for that purpose,

under and by virtue of the authority conferred upon said Board by an act of the General Assembly of the State of Ohio, passed May first, 1885, entitled "An act to amend an act entitled an act to authorize the Ohio State Board of Agriculture to issue bonds for fair ground improvements," passed April 10, 1884, published in volume eighty-two, (82) of Ohio Laws, page 218, in substance, as follows:

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That the act entitled an act to authorize the Ohio State Board of Agriculture to issue bonds for fair ground improvements, passed April 10, 1884, be amended so as to read as follows:

Sec. 1. The Ohio State Board of Agriculture is hereby authorized to borrow money, not exceeding eighty thousand dollars, and to issue its bonds therefor in such denominations as it may deem best, bearing interest at a rate not exceeding six per cent. per annum, payable semi-annually, and secure the payment of the same by a mortgage of its real estate with the improvements thereon.

Sec. 2. Said bonds shall be payable within twenty years from their date, at such times as the said Board shall direct, and shall not be sold for less than the par value thereof.

Sec. 3. The money so borrowed shall be used only for the purpose of improving the Ohio State Fair Grounds owned by said Board and erecting buildings thereon.

Sec. 4. For the payment of the indebtedness incurred by virtue of this act the Ohio State Board of Agriculture shall create a sinking fund, in which shall be placed annually, until such indebtedness has been paid, not less than fifty per cent. of the surplus earnings of the Ohio State Fair.

SECTION 2. Said original act, entitled an act to authorize the Ohio State Board of Agriculture to issue bonds for fair ground improvements is hereby repealed.

SECTION 3. This act shall take effect and be in force from and after its passage.

A. D. MARSH,

Speaker of the House of Representatives.

JOHN G. WARWICK,

President of the Senate.

Passed May 1, 1885.

AND WHEREAS, Also the said Ohio State Board of Agriculture, party of the first part, did, on the 25th day of June, A. D. 1885, for the purpose of borrowing said money as aforesaid, adopt certain resolutions, as follows:

Resolved, First—That Ohio State Board of Agriculture for the purpose of improving the Ohio State Fair Grounds, owned by it, and erecting buildings thereon, deem it expedient and necessary to borrow upon the credit of the Board and its property the sum of sixty thousand dollars, under the authority of the act of the General Assembly of the State of Ohio, passed May 1, 1885, entitled "an act to amend an act entitled an act to authorize the Ohio State Board of Agriculture to issue bonds for fair ground improvements," passed April 10, 1884.

Resolved, Second—That in order to effect such loan there be prepared for issue and negotiation one hundred and twenty bonds of the Board, to be numbered consecutively from one to one hundred and twenty, to be sealed with its corporate seal, to be signed by its President and countersigned by its Treasurer, and duly authenticated by the certificate of the trustee named in the mortgage deed to be executed to secure the payment thereof, each of said bonds to be for the sum of five hundred dollars, bearing date July 1, 1885,

payable to Edward K. Stewart, Trustee, or to the bearer thereof, at any time after five years and within twenty years from their date, at the pleasure of this Board, with interest thereon from the first day of July, A. D. 1885, at the rate of six per cent. per annum, payable semi-annually, on the first days of January and July successively each year until the principal is paid, for the several installments of which forty coupons, each for the sum of fifteen dollars, shall be executed, to be attached to each of said bonds, signed by the Treasurer of this Board; both principal and interest payable at the office of this Board in the city of Columbus, O.; that all of said bonds shall be sold in consecutive numbers, beginning with number one, and shall be called for redemption in the inverse order of their issue; and that not more than five thousand dollars of the issue shall be called during any year, except during the year 1905.

Resolved, Third—That for the purpose of securing the payment of the said bonds, and the interest thereon, a mortgage in the nature of a conveyance in trust be duly executed by this Board to Edward K. Stewart, as Trustee, conveying to him, his heirs, successors and assigns in trust, for the purposes aforesaid, all the real estate, lands and tenements, situate in Franklin county, Ohio, owned and held by this Board in fee simple, and known generally as the Ohio State Fair Grounds, as the same are described in the conveyance thereof to the Board by W. N. Cowden and Lovell B. Harris, as trustees in trust for Ohio State Board of Agriculture, by deed dated May 5, 1885, by Henry T. Chittenden and wife, by deed dated May 17, 1884, by Abraham Dow and wife, by deed dated June 1, 1885, and by Joseph Monnett and wife, by deed dated June 1, 1885; conditioned to be void upon full payment of said bonds and coupons, and with such other and further conditions, stipulations and provisions, as are usual in like instruments, and as the President of this Board, by executing said instruments, shall adopt and approve. Said mortgage shall be executed by the President of this Board, signing thereunto the corporate name, and affixing the corporate seal of this Board, and attested by the Secretary of the Board, and acknowledged in due form of law in the name and on behalf of this Board by the President and Secretary thereof, and be delivered to the trustee therein named, to hold for the benefit of all persons or corporations who may become owners of said bonds. Said mortgage or deed of trust shall also embrace the warrant of attorney of this Board, irrevocable, by which whenever default shall be made in the payment of said bonds or interest for six months after due, this Board shall authorize any lawful attorney of the State of Ohio to enter its appearance without process in a court of competent jurisdiction in said State, to a petition filed by said trustee for a foreclosure of said mortgage and sale of said premises, consenting thereto, or to the appointment of a receiver therein, and to waive all errors, exceptions, appeals and petitions of errors thereon.

And whereas, further, said Ohio State Board of Agriculture, party of the first part, under and in pursuance of said resolutions, hath prepared and executed, and now holds to be authenticated by said trustee, issued and negotiated, the aforesaid one hundred and twenty bonds of said Board, as above described, bearing date July 1, A. D. 1885, for the sum of five hundred dollars each, payable to Edward K. Stewart, trustee, or to the bearer thereof, at any time after five years and within twenty years from their date, at the pleasure of said Board, with interest thereon from the first day of July, A. D. 1885, at the rate of six per cent. per annum, payable semi-annually on the first days of January and July successively each year until the principal is paid, for the several installments of which forty coupons, each for the sum of fifteen dollars, are attached to each of said bonds, signed by the Treasurer of said Board,

both principal and interest of said bonds being made payable at the office of said Board, in the city of Columbus, Ohio, with a provision therein that all of said bonds shall be sold in consecutive numbers beginning with number one, and shall be called for redemption in the inverse order of their issue, and not more than \$5,000 of said issue shall be called during any year except during the year, A. D. 1905, all of which bonds are of like tenor, and, omitting signatures of said President, Treasurer and Trustee, and seals, are in the form following, to wit:

No.

STATE OF OHIO.

\$500.00

OHIO STATE BOARD OF AGRICULTURE.

Six per cent. 5 to 20 years First Mortgage Bonds for improving New State Fair Grounds.

Know all Men by these Presents, That the OHIO STATE BOARD OF AGRICULTURE acknowledges itself to owe to Edward K. Stewart, Trustee, or to the bearer hereof, the sum of FIVE HUNDRED DOLLARS, to be paid at its office, in the city of Columbus, Ohio, at any time after five years and within twenty years from the date of this bond, at the pleasure of said Ohio State Board of Agriculture as hereinafter specially provided, with interest thereon at the rate of six per cent. per annum, payable semi-annually at the office of the said Board of Agriculture on the first day of January and the first day of July successively, each year, until the principal is paid, according to and upon presentation and surrender of the interest coupons hereunto attached as they severally become due.

This bond is one of a series of *one hundred and twenty bonds*, numbered consecutively from *number one to number one hundred and twenty* inclusive, all of like date and amount and of the same tenor, and amounting in the aggregate to the sum of SIXTY THOUSAND DOLLARS, issued in pursuance of an act of the General Assembly of the State of Ohio, passed May 1st, 1885, specially authorizing their issue, and in substance as follows:

"Section 1. The Ohio State Board of Agriculture is hereby authorized to borrow money not exceeding eighty thousand dollars, and to use its bonds therefor, in such denominations as it may deem best, bearing interest at a rate not exceeding six per cent. per annum, payable semi-annually, and secure the payment of the same by a mortgage of its real estate, with the improvements thereon.

"Section 2. Said bonds shall be payable within twenty years from their date, at such times as the said Board shall direct, and shall not be sold for less than the par value thereof.

"Section 3. The money so borrowed shall be used only for the purpose of improving the Ohio State Fair Grounds, owned by said Board, and erecting buildings thereon.

"Section 4. For the payment of the indebtedness incurred by virtue of this act, the Ohio State Board of Agriculture shall create a Sinking Fund, in which shall be placed annually, until such indebtedness has been paid, not less than fifty per cent. of the surplus earnings of the Ohio State Fair."

The payment of the principal and interest of all the said one hundred and twenty bonds, without priority or preference among the holders thereof, is provided for by the Sinking Fund created by the law authorizing this issue, and is secured by a first mortgage bearing even date herewith, made by the said State Board of Agriculture to Edward K. Stewart, Trustee, conveying to him in trust for the equal security of all of said one hundred and twenty bonds all the real estate of the said State Board of Agriculture, to wit: Its Fair Grounds of about ninety acres of land (located at the city of Columbus, in Franklin Co., O., and more particularly located and described in said mortgage to which reference is

hereby made for particulars), together with all the buildings and improvements already and hereafter made or placed thereon by the said Board of Agriculture. And the said Ohio State Board of Agriculture hath and doth hereby direct as a part of this obligation that all bonds of this series shall be sold in CONSECUTIVE NUMBERS, beginning with number one, and shall be called for redemption in the INVERSE ORDER OF THEIR ISSUE, and that not more than five thousand dollars of the issue shall be called during any year, except during the year NINETEEN HUNDRED AND FIVE when they all become due.

IN WITNESS WHEREOF, the said State Board of Agriculture has caused this Bond to be sealed with its Corporate Seal and to be signed by its President, and countersigned by its Treasurer, and the coupons hereunto annexed to be evidenced by the signatures of its Treasurer, on this first day of July, A.D. 1885.

C. D. BAILEY, *President.*

JNO. C. LEVERING, *Treasurer.*

[L. S.] (Indorsed). COLUMBUS, OHIO, (day of issue), 1885.

I hereby certify that this bond is one of the series of one hundred and twenty bonds of like denomination and tenor described in and secured by the within mentioned mortgage or deed of trust.

Witness my hand, this day of, A.D. 1885.

EDWARD K. STEWART, *Trustee.*

All of said interest coupons are, omitting the date of payment and number of the bond to which it is attached, of like tenor, and are, omitting the signature of the Treasurer of said Board, in form following:

\$15.00

INTEREST COUPON.

\$15.00

OHIO STATE BOARD OF AGRICULTURE.

Six per cent. bonds for improving New State Fair Grounds.

The Ohio State Board of Agriculture will pay the bearer, at their office, in the city of Columbus, on the day of, fifteen dollars for six months' interest on this bond for \$500.

No.

....., *Treasurer.*

Now, therefore, This indenture witnesseth that the Ohio State Board of Agriculture, party of the first part, in pursuance of the power conferred as aforesaid by law, and of its resolutions aforesaid, in consideration of all and singular the premises hereinafter recited, and of the sum of \$1.00 to it in hand paid before the ensembling of these presents, by Edward K. Stewart, Trustee, party of the second part, the receipt of which is hereby acknowledged; and for the better securing the punctual payment of each and all of the bonds and their said interest coupons aforementioned, when the same shall become due and payable as aforesaid, hath bargained and sold and by these presents doth grant, bargain, sell, alien, release and convey unto the said Edward K. Stewart, Trustee, party of the second part, his successors, heirs and assigns forever, all and singular, the following lands and tenements, situated in Clinton township, Franklin county, Ohio, being lot No. 19 (nineteen) in Barcus and Robinson's sub division of lot No. 8 (eight) in Stevenson's survey, so called, made in partition among heirs of George Stevenson, of section four (4), township one (1), range eighteen (18), United States Military Lands; reference being had and made to the plat of said survey, recorded in second chancery record 322, and of said sub-division in the recorder's office in said Franklin county.

Said lot No. nineteen (19), with other lots of land in said sub-division, was

sold and conveyed to Ezekiel S. Woods, of Newark, Licking county, Ohio, by George L. Converse and Sarah E., his wife, of Columbus, O., by deed of general warranty, dated November 15, 1866, which deed is duly recorded in volume 89 of the deed records of said county, pages 483 and 484, reference to which is hereby had and made; and said lot No. nineteen was by said Ezekiel S. Woods, in his last will and testament, made March 27, 1872, with other lots of land in said subdivision, devised and bequeathed to Mary B. Manypenny, his daughter, in fee simple, which said last will and testament was duly admitted to probate and record in said county of Licking, Ohio, on the 12th day of February, A. D. 1880; the testator having died on the 7th day of February, A. D. 1880, and said last will and testament is recorded in record of wills of Licking county, Ohio, book G, page 374, and a copy thereof with a copy of the probate thereof, duly certified, is recorded in the probate court of Franklin county, Ohio, record of wills, book H, page 123, reference to which is hereby had and made; and said lot nineteen (19), being the same premises that were conveyed to Mary Margaret Innis by said Mary B. Manypenny and her husband, by deed dated April 14, 1883, recorded in deed records of said county, book 160, page 257, and being the same premises that were conveyed to Lovell B. Harris and W. N. Cowden, as trustees in trust for Ohio State Board of Agriculture, by William H. Innis and Mary Margaret Innis, his wife, by deed, dated December 27, 1883, and recorded in deed records of said county, book 167, page 118, etc.

Also the following premises, situate in said county and State aforesaid, and in said Clinton township, and being parts of lots Nos. seven (7) and fourteen (14), as designated in a proceeding in partition between the heirs of George Stevenson, of quarter township four ($\frac{1}{4}$ township 4), township one (1), range eighteen (18), U. S. Military Lands, in the court of Common Pleas of Franklin county, Ohio, as recorded in volume 2, of chancery complete records, pages 318-322, bounded and described as follows:

Beginning at a locust post, northeast corner to said lot No. 7 (seven), southeast corner to said lot No. fourteen (14), witness a beech 16 inches in diameter, at date of said partition, bearing north 72° , east 13 links distant; thence with the east line of said lot No. seven (7), south $1^{\circ} 16'$, west 30 97-100 poles to a stone in said line, planted for the southeast corner of a parcel of one hundred and ten (110) acres, five and a third ($5\frac{1}{3}$) poles of land, conveyed by William Neil and wife to Anna E. Dennison, by deed, dated December 26, 1856, recorded in book 61, page 499, of deed records of said county; thence with the south line of said last mentioned parcel, north $88^{\circ} 30'$, west fifty-one 33-100 (51 33 100) poles, to a stake in the east line of the parcel of land conveyed by William Neil and wife to the Cleveland, Columbus and Cincinnati Railroad Company by deed, dated June —, 1853, recorded in deed records of said county, book 51, page 185; thence with said last mentioned line north $5^{\circ} 15'$, west sixty-nine 29-100 poles to a stake in said line at its intersection with the south line of a parcel of land containing one hundred and eleven (111) acres, one hundred and one (101) poles, conveyed by William Neil and wife to their son, Robert E. Neil, by deed dated December 26, 1856, recorded in book 61, page 489, of deed records of said county; thence with said south line of said last mentioned parcel, south $88^{\circ} 30'$, east fifty-eight 19 100 poles, to a stone in the east line of said lot No. fourteen (14) of said Stevenson partition, southeast corner to said parcel so as aforesaid conveyed to said Robert E. Neil, and northeast corner to said parcel so as aforesaid conveyed to said Anna E. Dennison; thence with said east line of said lot No. fourteen (14), south $1^{\circ} 16'$, west thirty-seven 84 100 poles to the beginning; containing twenty-three 749 1000 (23 749-1000) acres of land, being same premises

that were conveyed to W. N. Cowden and Lovell B. Harris, as trustees in trust for Ohio State Board of Agriculture, by Anna E. Dennison, by deed dated December 29, 1883, and recorded in deed records of said county, book 167, page 119.

Also the following premises situated in the county and State aforesaid, viz.: Being lot No. fifteen (15) in Barcus and Robinson's sub division of lot No. eight (8) known as part of Stevenson's survey, plat of same is recorded in Recorder's office of Franklin county, Ohio; said lot contains five (5) acres, being same premises conveyed to W. N. Cowden and Lovell B. Harris, as Trustees, in trust for Ohio State Board of Agriculture, by William M. Murdock, by deed, dated December 28, 1883, and recorded in deed records of said county, book 167, page 120. Also the following premises in the county, township and State aforesaid, described in tracts or parcels as follows, to-wit:

First Tract—Being twenty acres off of the west end of lot No. thirteen (13) of the sub division of Stevenson's fourth quarter of first township, eighteenth range, United States Military Lands, among the heirs of Stevenson. The north and south lines of said twenty (20) acres to be of equal length.

Second Tract.—Being part of lot No. thirteen (13) in section No. 4, in township No. 1, range No. 18, United States Military Lands, as said lot is delineated on the recorded plat of the sub-division of said section among the heirs of George Stevenson, deceased, in the Chancery Records of the Court of Common Pleas in and for said county of Franklin, in book No. 2, page 318. The land hereby conveyed being bounded as follows: Beginning at a stake in the south line of said lot No. 13, south-east corner to said above described 20 acre lot, and running thence along said east line thereof, north 1° and $45'$, east 100 poles to a stake in the north line of said lot No. 13, north-east corner to said above described 20 acre lot; thence along the north line of said No. 13, south 88° , east 24 poles to a stake; thence south 1° , $45'$, west 100 poles to a stake in the south line of said lot No. 13; thence along said south line north 88° , west 24 poles to the beginning, containing fifteen (15) acres.

Third Tract—Lots Nos. sixteen (16) and seventeen (17) of Robinson and Barcus sub division of lot No. eight (8), known as part of Stevenson's survey as the same are numbered and delineated on the recorded plat thereof of record in plat book No. 1, page 130. Recorder's office of Franklin county, Ohio. Said two lots are estimated to contain five acres each, being same premises conveyed to said W. N. Cowden and Lovell B. Harris, as Trustees, in trust for Ohio State Board of Agriculture, by Thomas D. Cassidy and wife, by deed, dated November 14, 1883, recorded in deed records of said county, book 167, page 121.

Also, the following premises situate in the county, township and State aforesaid: Being lot No. eighteen (18) in Barcus and Robinson's sub division of lot No. eight (8) in Stevenson's survey (so called) made in partition among the heirs of George Stevenson of section four (4), township one (1), range eighteen (18), United States Military Lands, reference being had and made to the plat of said Stevenson's survey, recorded in Chancery Records of the Court of Common Pleas of said county, book 2, page 322, and to the plat of said Barcus and Robinson's sub division of said lot eight (8), recorded in plat records of said county, book 1, page 130. Said lot eighteen (18) contains five (5) acres of land, more or less, being the same premises that were conveyed to W. N. Cowden and Lovell B. Harris, as Trustees, in trust for Ohio State Board of Agriculture, by William Tu pie and wife, and George T. Jones and wife, by deed, dated March 25, 1884, and recorded in deed records of said county, book 167, page 341. All the real estate hereinabove described being same premises as conveyed to Ohio State Board of Agriculture by W. N. Cowden

and Lovell B. Harris, Trustees, in trust for Ohio State Board of Agriculture, by deed, dated May 5, 1885.

Also the following premises situate in the county, township and State aforesaid, to-wit: Beginning at a point in the east line of lot seven (7) of George Stevenson's heirs sub division of section four (4), township one (1), Clinton township, Franklin county, Ohio, two hundred (200) feet north 1° , $16'$ east from the center of a street in Robinson and Barcus' sub division of lot eight (8) of Stevenson's heirs sub division which center is the center of the west line of lot eight (8) referred to above, and said point of beginning is the northeast corner of a piece of land conveyed by said Chittenden to Henry P. Stewart (said Stewart's deed as recorded has been burned); thence north 88° , $30'$ west along the north line of H. P. Stewart's and Joseph Monett's north line (200) feet to the north-west corner of Joseph Monett's land; thence south 1° , $16'$ west along Monett's west line two hundred (200) feet to the center of street referred to above; thence north 88° , $30'$ west, parallel to the north line of a 500 acre tract described in book A, page 113 and 114 of the Franklin county, Ohio, records, in center of said street six hundred and sixty and twenty-three one hundredths (660 23-100) feet to the center of Cleveland, Columbus, Cincinnati and Indianapolis R. R.; thence north 5° , $15'$ west in center of said railroad three hundred and twenty and eighty two one hundredths (320 82-100) feet to the inter section of said railroad line and Mrs. Anne E. Dennison's south line; thence south 88° , $30'$ east parallel to said 500 acre tract, north line, eight hundred and ninety-six and sixty-four one hundredths (896 64-100) feet to a stone in the east line of said lot No. seven (7); thence south 1° , $16'$ west along the east line of said lot seven (7), one hundred and nineteen and forty-seven one hundredths (119 47-100) feet to the place of beginning, containing (after the strip of ground fifty (50) feet wide which is taken off the west side of the above described land for right of way for C., C., C. & I R. R.), five and fifty-five one hundredths (5 55-100) acres of ground, being same premises conveyed to said Ohio State Board of Agriculture by H. T. Chittenden and wife, by deed, dated May 17, 1884, and recorded in deed records of said county, book 166, page 538.

Also, the following premises situate in the county, township and State aforesaid, and bounded and described as follows, to-wit: Commencing at that point in the eastern line of Henry T. Chittenden's Woodburn Addition to Columbus, where the same is intersected by the north line of the lane in Robinson and Barcus sub division; thence west in the extended line of said lane, one hundred (100) feet; thence north at right angles, one hundred and seventy-five (175) feet to a point; thence east at right angles one hundred (100) feet to Manypeny's west line; thence south with Manypeny's west line one hundred and seventy-five (175) feet to the beginning, being same premises conveyed to Ohio State Board of Agriculture by Abraham Dow and wife, by deed, dated June 1, A. D. 1885.

Also, the following premises, situate in the county, township and State aforesaid, and bounded and described as follows, to-wit: A part of Henry T. Chittenden's Woodburn Addition to the city of Columbus, as delineated on plat record No. 1, page 384, etc.; commencing at a point on the north side of the street in Robinson and Barcus sub-division, as it would be if extended, being southwest corner to H. P. Stewart's land; thence north with said Stewart's west line one hundred and seventy five (175) feet to Stewart's northwest corner; thence west at right angles one hundred (100) feet to a point; thence south at right angles one hundred and seventy five (175) feet to a point; thence east at right angles one hundred (100) feet to beginning; being same premises conveyed to said Ohio State Board of Agriculture by Joseph

Monett and wife by deed, dated June 1, 1885: Together with all the buildings and improvements that heretofore have been or hereafter shall be made, erected or placed thereon by said Ohio State Board of Agriculture; to have and to hold the said lands and tenements, with the appurtenances thereunto belonging, unto the said Edward K. Stewart, Trustee, party of the second part, his heirs, successors and assigns forever. In trust, nevertheless, for the person and persons, corporation and corporations, and for the equal pro rata benefit, security and protection of the person and persons, corporation and corporations, who or which may be or become holders of the bonds and interest coupons aforementioned, issued or to be issued, by said Ohio State Board of Agriculture, or any or either of them, without preference, priority or distinction as to lien or otherwise, of any over others, by reason of priority of time of issuing or negotiating the same, and so that each and all of said bonds and its and their said interest coupons shall have the same right, lien and privilege under and by this deed of trust or mortgage, and shall all be equally secured hereby, with like effect as if they had all been made, executed, delivered and negotiated simultaneously on the date hereof; and in trust also for enforcing the payment of said bonds and interest coupons, when due and payable, in accordance with the true intent and meaning of the stipulations of this instrument, and of said bonds and interest coupons.

And for the better assuring and confirming the title and power of said Edward K. Stewart, Trustee, party of the second part, his heirs, successors and assigns, the said party of the first part hereby covenants with the said party of the second part, his heirs, successors and assigns that at any time hereafter, and so often as may be required by the party of the second part, or the person or persons holding the above granted estate in trust, said party of the first part will do such act and make such further assurance in law as such trustee or trustees shall, by counsel learned in the law, be reasonably advised are necessary for, or tend to, the better carrying out the object and intent of the parties to this mortgage or deed of trust; provided, always, and these presents are upon this express condition, that if said Ohio State Board of Agriculture, party of the first part, its successors or assigns shall well and truly pay and discharge, or cause to be paid and discharged, unto each and all the holders of said bonds to be issued as aforesaid, the principal and interest to grow due thereon at the times, in the manner and at the place as stipulated in said bonds and interest coupons, the said principal and interest shall become due and payable according to the true intent and meaning thereof, then these presents and the estate and rights hereby granted shall cease, determine and be void; otherwise, of full force and virtue, in law, to be and remain forever.

Said party of the first part for itself, its successors and assigns doth further covenant and agree unto and with the said party of the second part, his heirs, successors and assigns that if any default shall be made in the payment of its said interest coupons, or any of them, for six months after falling due and being demanded, then each and all of said bonds, issued as aforesaid, shall be due and payable; and if any default be made in the payment, when due, of any money, principal or interest, secured by this mortgage or deed of trust, and stipulated to be paid in the bonds or interest coupons, according to the tenor and effect thereof, and the same shall remain due and unpaid for six months after the same shall have been demanded by the legal holder or holders thereof, then the party of the first part shall, upon the written demand of the party of the second part, or of the trustee or trustees, for the then time being, forthwith surrender to said second party, such trustee or trustees, or his or their agent or attorney the actual possession of all and singular, the lands and tenements, premises and rights hereby conveyed or intended to be conveyed,

together with all the appurtenances thereunto belonging and buildings thereon erected by said party of the first part, to hold, use, manage and receive the rents, issues, income and profits thereof for the benefit of the holders of said bonds, making from time to time all needful repairs, alterations and additions, and paying all proper costs, charges and expenses of so taking, holding and managing the same, including a reasonable compensation to said trustee from the income thereof, rendering accounts to the party of the first part until such time as said party of the second part, or such trustee or trustees shall cause said premises, lands and tenements to be sold as hereinafter provided, or other disposition be lawfully made thereof.

And said party of the first part doth by these presents execute and give its warrant of attorney, by which, whenever and so often as default shall be made by said party of the first part in the payment of either principal or interest of any of said bonds, or any part thereof as therein stipulated, for the period of six months after the same shall have become due and payment thereof demanded, the said party of the first part doth authorize and empower any lawful attorney-at-law, of the State of Ohio, to enter the appearance of said party of the first part without process in any court of competent jurisdiction in the State of Ohio, to any bill or petition filed by said party of the second part, or the then trustee or trustees, for the foreclosure of this mortgage or deed of trust and the sale of the lands and tenements herein described and conveyed, or intended to be conveyed, or any part thereof, and if requested by said party of the second part, or said trustee or trustees, to consent on behalf of said party of the first part, that a receiver be appointed forthwith, by order of said court, to take possession of said premises, lands and tenements, or any part thereof, upon such terms as such court shall prescribe; and to consent also that a decree or order be granted by such court for the sale of the whole or any part of said premises, lands and tenements, under the direction of such court, and to enter on behalf of the party of the first part a stipulation therein not to impede, delay or appeal, exceptions, petitions in error or otherwise, the execution of such decree or order, but to waive all error, exception and appeal thereon; provided, however, that said party of the second part, or such trustee or trustees shall not demand the surrender of the possession of said lands and tenements or any part thereof, or file a bill or petition for the foreclosure of this mortgage or the sale of said premises, unless first requested so to do in writing by the then holders of at least one-half in amount of the bonds hereby secured then outstanding, and upon being properly indemnified and adequate funds or security therefor being furnished against and for the payment of all costs, expenses and liabilities to be by the party of the second part incurred, nor shall any order or decree as aforesaid be made or rendered until after thirty days' notice of the time and place of applying for the same shall have been given to said Board; and the proceeds arising from any sale made of said premises as herein provided, or otherwise, shall be applied as follows:

First—To the payment unto said party of the second part, or such trustee or trustees, all reasonable costs, charges and expenses for counsel fees and otherwise, and including a reasonable compensation for said trustee, and to indemnify him or them from all liability in the premises.

Second—To the payment without giving preference, or priority, or distinction in any way to one over another to the holders of said bonds; first, of the interest then due on said bonds outstanding and intended to be hereby secured; and, secondly, of the principal of said bonds in full, if said proceeds shall be sufficient, but if not, then pro-rata among the same.

Third—In the event of there being in the hands of said party of the second part, or said trustee or trustees, or other party or parties any portion of said

trust estate, or the proceeds thereof, after the payment in full of the principal and interest of said aforesaid bonds, then he or they shall re convey, re-transfer or pay over the same to the party of the first part for its sole use and benefit.

And it is hereby mutually covenanted and agreed between the parties hereto that the party of the second part, and any other trustee or trustees succeeding to this trust, shall be responsible only for gross neglect and willful default, and shall not be under any obligation to take any action toward the execution of this trust which in his or their opinion will be likely to involve him or them in personal expense or liability, unless some one or more of said bond-holders shall, as often as required by said trustee or trustees, give him or them reasonable indemnity against the same, any thing herein to the contrary notwithstanding, and in the execution of this trust, the said trustee or trustees shall have full power and authority of arbitrament and compromise, and of appointing agents and attorneys to act in his or their behalf.

And it is hereby further mutually covenanted and agreed between the parties hereto that said party of the second part, or his successor or successors in this trust, may resign and discharge himself of the trust hereby created by a notice in writing to the party of the first part, to be given at least three months before such resignation shall take effect, or such shorter time as said party of the first part shall accept as adequate; and whenever a vacancy shall occur in said trusteeship by death, resignation, incapacity, inability to act or renewal by legal authority of said party of the second part, or any trustee or trustees, lawfully succeeding to the trust, said party of the first part, and its successors and assigns, shall have the right to appoint a successor or successors to fill the vacancy, which appointment shall be attested by the certificate, in writing, by the President and Secretary of the said Board, under its corporate seal, and the written acceptance thereof by the person or persons appointed. But if said party of the first part shall neglect or refuse to fill any such vacancy for thirty days, or if any other good cause be shown therefor, such vacancy shall be filled by order of any court of competent jurisdiction in the State of Ohio, upon the proper application therefor by the holders of one-third in amount of the bonds hereby secured then outstanding, or by an agreement in writing between such one third of said bond-holders and the party of the first part; and any trustee or trustees appointed to fill any such vacancy shall be charged and vested with and entitled to all the rights, title, interest estate, powers, duties and trust herein conveyed, created and contained, as if he or they had been originally named as such trustee in this instrument, and should any deeds, conveyances or instruments in writing to be executed, acknowledged and delivered on the part of the party of the first part, and the resigning or removed trustee be required by such new trustee or trustees, for more fully vesting in and confining to him or them such estate rights, powers and duties, such deeds, conveyances and instruments of writing shall on request be made, executed and acknowledged by said parties respectively.

In testimony whereof the said Ohio State Board of Agriculture hath caused its corporate name to be hereunto signed and its corporate seal to be hereunto affixed by Charles D. Bailey, its President, and attested by William I. Chamberlain, its Secretary, thereunto by it duly authorized; and the said Edward K. Stewart, Trustee, in testimony of his acceptance of the trusts hereof has

hereunto signed his name as such trustee and set his seal this the day and year first above written.

{ SEAL OHIO STATE BOARD OF AGRICULTURE. }	[SEAL]	OHIO STATE BOARD OF AGRICULTURE, BY CHARLES D. BAILEY, its President.
	[SEAL]	Attest: WILLIAM I. CHAMBERLAIN, Secretary of Ohio State Board of Agriculture.
	[SEAL]	EDWARD K. STEWART, Trustee.

Signed, sealed and acknowledged in presence of

J. WM. BALDWIN,
HERBERT E. BRADLEY.

State of Ohio, Franklin County, ss.:

Before me, the undersigned, a Notary Public in and for said county, personally came Charles D. Bailey, President and William I. Chamberlain, Secretary of the Ohio State Board of Agriculture, and the said Ohio State Board of Agriculture, by Charles D. Bailey, its President, and William I. Chamberlain, its Secretary, the grantor, described in and who to my personal knowledge signed and sealed the foregoing instrument and acknowledged the signing thereto of the corporate name and the ensembling thereof with the corporate seal of said Board, to be their and each their voluntary official act and deed as such president and secretary respectively of said Board, and the voluntary corporate act and deed of said Board by them, its president and secretary as aforesaid, and the said Charles D. Bailey and William I. Chamberlain being by me first sworn, say that the said Charles D. Bailey is president and the said William I. Chamberlain is secretary of the said Ohio State Board of Agriculture; that they know the corporate name and seal of said Board; that they are duly authorized and empowered, by resolution of said Board duly passed, to execute and acknowledge the above deed of trust or mortgage as the same is above executed; that the name of said Board thereto signed is its genuine corporate name; and that the seal of said Board thereto affixed is its genuine corporate seal, and that the said name was so signed, and said seal so affixed thereunto by said president and attested by said secretary, by order of said Ohio State Board of Agriculture.

In witness whereof, I have hereunto set my hand and official seal this, the first day of July, A. D. 1885.

[SEAL]

J. WM. BALDWIN,
Notary Public of Franklin County, Ohio.

RECORDER'S OFFICE, FRANKLIN COUNTY, O.

This instrument, filed for record this July 1, 1885, at 3 o'clock p.m.; recorded August 22, 1885, in Franklin County Record of Mortgages, volume 99, pages 110 to 127.

F. M. SENTIER, *Recorder.*

Board took recess to 8 o'clock a.m.

JUNE 26, 8 A.M., 1885.

The Board visited the grounds and inspected them. After the return it was *Voted*, That Messrs. Bailey, Levering, Pow and Talcott be a committee to confer with the county commissioners relative to the extension of Eighth street to the fair grounds.

At 12 o'clock, noon, bids were opened for the bonds, as follows:

NEW YORK, June 24, 1885

J. C. Levering, Treasurer Ohio State Board of Agriculture:

DEAR SIR: If you can see your way to make coupons payable in New York City, I will take \$30,000 at 104½ and interest accrued.

Yours respectfully,

H. B. BRUNDRETT, *President.*

And probably the balance, unless higher prices.

COLUMBUS, June 26, 1885.

The Ohio State Board of Agriculture:

DEAR SIR: We bid you 100½ and accrued interest for the \$60,000 of first mortgage bonds to be issued by you—all or none—provided you deposit the proceeds with this bank, subject to your order as required in making the proposed improvements.

Very respectfully,

GEO. W. SINKS, *President.*

(Telegram.)

NEW YORK, June 25, 1885.

J. C. Levering, Treasurer Ohio State Board of Agriculture:

Consider my bid on your bonds as withdrawn.

H. B. BRUNDRETT.

On motion of Mr. Foster, it was

Voted, That the bonds be awarded to the Deshler Bank, Columbus, on its bid of "100½. and accrued interest, provided the Board deposit the proceeds with that Bank, subject to the order of the Board as required in making the proposed improvements." Also that the Secretary officially notify the Deshler Bank of this action, and that the proper officers execute and deliver the bonds to the Bank, and the mortgage to the Trustee, in accordance with the tenor of the preceding action and resolutions of the Board.

Recess until 2 p.m.

JUNE 26, 1885—2 P.M.

Messrs. Bailey, Levering and Fleming were made a committee to draft a petition for a review of the proposed extension of Eighth street to the Fair Grounds, with the understanding that its south terminus coincide with the center line of Eighth street at Fifth avenue, and that its center line at its north terminus coincide with the center line of the main avenue or drive of the Fair Grounds at its south terminus near the south-east corner of the Fair Grounds, and that the road be as direct as circumstances admit.

On motion of Mr. Foster, the Secretary was instructed to notify the absent members of the Board of the sale of the bonds.

On motion of Mr. Talcott, the selecting of roofing for buildings on the Fair Grounds, and the advertising and letting of contracts for necessary building and material were referred to the Executive Committee.

The Board adjourned subject to the call of the President. The President instructed the Secretary to call a meeting of the Executive Committee for July 1st, at 9 a.m.

STATE AGRICULTURAL ROOMS,
COLUMBUS, OHIO, *July 1, 1885.*

The Executive Committee met pursuant to the call of the President.

The minutes of the last meeting of the Board were read and approved.

Messrs. Terrell & Morris, Architects, were requested to be present in the evening to report progress on designs and specifications, and confer in regard to advertising for contracts for material and construction.

On motion of Mr. Levering, a committee consisting of Messrs. Bailey, Bonham and Fleming was appointed to confer with the commissioners in regard to a review of the proposed extension of Eighth street. The committee to draft petition, reported the form of petition already prepared and signed by 22 parties (land owners). It was

Voted, That in case the judgment against the Turpie land has not been paid, that the President and proper officers clear up the title by deposit or indemnity bond to the satisfaction of the Deshler Bank, the purchasers of the mortgage bonds.

The Secretary was instructed to purchase a horse lawn-mower, horse lawn-shoes and hand lawn-mower, at as good terms as possible and of sizes advised by Mr. H. Haerlin, landscape gardener.

On motion of Mr. Foster, the President and Treasurer were constituted a committee to meet the viewers of the proposed road extension on Friday, July 17th.

The indemnity expense bond was ordered signed by the officers.

The mortgage to E. K. Stewart, Trustee, was executed and filed for record. The first 40 bonds, Nos. 1 to 40, inclusive, were executed and delivered to the Trustee for his certificate.

Recess until 8 p m.

JULY 1, 1885—8 P.M.

The Committee was called to order.

Space was voted Terrell & Morris for Builders' Bazaar to exhibit building material and supplies "in place" in the building itself (built in) and loose displays inside, the building to cost some \$30 000, to be of tasteful design, located by the Board and erected by parties, furnishing material or making subscriptions, and without expense to the Board.

Mr. Terrell submitted plans, for final criticism, for grand stand, power hall, and stables, stalls and pens for 400 horses, 400 cattle, 600 swine and about 500 sheep, which were adopted with slight changes noted by the architect; also poultry house, and band stand and judges' stand.

On motion of Mr. Foster, it was

Voted, That the Secretary and the architect prepare and insert in two dailies of opposite politics in Cleveland, Toledo, Detroit and Columbus, and in the American Architect and Building News, Boston, Mass., a two-inch advertisement (about) inviting bids for construction of the above buildings, said bids to be opened at 12 o'clock M., August 3d, the Board reserving the right to reject any or all bids. Said advertisements to be inserted six times in the dailies and three times in the Building News, a weekly.

On motion of Mr. Bonham, it was

Voted, That the Secretary advertise in the three Columbus dailies e.o.d. 2 weeks, for 5,000 cubic yards first quality limestone gravel, suitable for walks and drives on Fair Grounds, the bids to be opened at 3 p.m., July 17th, the gravel to be delivered before November 1.

On motion of Mr. Levering, it was

Voted, That the grand stand and power hall be roofed with slate, provided it can be had on the offer of \$4.65 per square, laid, besides sheeting.

The Bodine Roofing Co., of Mansfield, Ohio, through its secretary and representative, Mr. Chas. B. Jamison, offered to lay its roofing complete (except sheeting) at \$4 00 per square, construct gutter and measure that in as a part of the roofing. Decision on this offer was deferred for actual examination by the Committee of the roofing actually laid at the Ohio Penitentiary.

On motion of Mr. Bonham, the Secretary was instructed to apply to the Police Commissioners for suitable policing of the grounds during the Fair, August 31, September 1, 2, 3 and 4, and to the City Council to make the necessary appropriation to pay for their services.

Adjourned.

JULY 2, 9 A. M.

The Executive Committee having visited and examined the Bodine roofing as per vote, met at the rooms.

The minutes were read and approved.

Mr. Chas. B. Jamison, Secretary of the Bodine Roofing Co., offered in addition to the previous offer that if the roofing on either power hall or grand stand, or both be awarded to his company, he will give a second coat of paint to either or both roofs immediately before September 1, 1886.

On motion of Mr. Foster, it was

Voted, That all important official actions of this Board be given to the press only when certified by the President and one of the Secretaries.

On motion of Mr. Bonham, it was

Voted, To reconsider the vote of yesterday to roof power hall and grand stand with slate.

On motion of Mr. Foster, it was

Voted, (Mr. Bonham dissenting), That power hall be roofed with the Bodine roofing on the above offer of Mr. Jamison, and that the grand stand be roofed with slate according to the original motion and vote.

On motion of Mr. Foster, it was

Voted, That a monthly statement be made to the Executive Committee at the beginning of each month of all moneys received and paid out, the source received from, and by and to whom paid.

On motion of Mr. Foster, it was

Voted, That H. Hærlin be asked to meet the President and Treasurer, July 17.

On motion of Mr. Levering, it was

Voted, That the plan proposed by Messrs. Blee and Irwin, of the Bee Line railway, to put the track outside and parallel to the grounds, be agreed to by the Board.

On motion of Mr. Foster, it was

Voted, That the name of the mover of each motion carried, be given in the records.

The two offers of the Bodine Roofing Co. having been requested by the Committee to be submitted in writing, were given as follows:

COLUMBUS, OHIO, *July 2, 1885.*

To the State Board of Agriculture, Columbus, Ohio :

GENTLEMEN.—We will furnish you our roofing for your proposed new power hall or grand stand, or for both, at the rate of \$4 00 per square, laid and painted with one coat of Prince's metallic paint, and give such ornamentation or variety of laying as can be agreed upon by your architect and ourselves, providing it does not require an unreasonable waste of our material.

If this offer is accepted, we also agree to give roofing, laid under this contract, an additional coat of paint prior just to the first fair you hold on your new grounds, without charge. The price above includes valleys and gutters, with tin connection for down spouts; payment for same to be made on architects estimates.

Respectfully,

THE BODINE ROOFING CO.,
CHAS. B. JAMISON, *Sec'y.*

COLUMBUS, OHIO, *July 2, 1885.*

To the State Board of Agriculture, Columbus, Ohio :

GENTLEMEN.—We will furnish you our roofing for your new cattle sheds, horse stalls, swine and sheep pens, and such other buildings as you may choose to use it upon, at the rate of \$4.00 per square, laid and painted with one coat of Prince's metallic paint after it is laid. We will further consult with your architect, and give as much ornamentation or variety in manner of laying the same as can be done without an unreasonable waste of our material. This price to include valleys and gutters, with tin connections for down spouts. Payments for same to be made on architects estimates.

Respectfully,

THE BODINE ROOFING CO.,
CHAS. B. JAMISON, *Sec'y.*

Mr. Terrell, architect, having, in conference with Mr. Jamison and the Board, given it as his opinion that the desired ornamentation could be secured, the Executive Committee voted, on motion of Mr. Foster, amended by Mr. Bonham, that the Bodine roofing be used not only on power hall as voted, but on all the stock buildings ordered built, provided the Bodine Roofing Company give the desired ornamentation in form of laps and manner of laying.

STATE AGRICULTURAL ROOMS,
COLUMBUS, *August 3, 1885.*

The Board met pursuant to the call of the President.

Present.—Messrs. Foster, Levering, Harris, Bonham, Brigham and the President.

In accordance with the advertisement of the Board, requesting sealed proposals for furnishing material and constructing the buildings on the State Fair grounds, the following were received :

BIDS RECEIVED FOR THE FURNISHING OF MATERIAL AND CONSTRUCTING THE BUILDINGS NAMED, ON THE STATE FAIR GROUNDS—GRAND STAND, HORSE STALLS, JUDGES AND MUSIC STANDS, SHEEP, SWINE AND CATTLE BUILDINGS, AND A POWER HALL.

Name of bidder and post-office.	Stone foundation, piers and walls.	Cut stone.	Brick.	Brick work.	Lumber.	Carpenter work.	Iron work.	Tin, galvanized iron and sheet-iron.	Painting and glazing.	For the entire work and materials.
Jos. Hamberger & Co., Columbus	\$1,400 00	\$400 00	\$400 00	\$300 00	\$26,971 00	\$3,000 00	\$2,000 00	\$1,800 00	\$5,000 00	\$52,767 40
Milholin & Black, Springfield	830 00		300 00	225 00	26,082 67	15,509 61	2,200 00	1,583 00	7,597 49	54,817 77
Nax Mohr, Columbus	1,820 00	†	325 00	||	26,547 60	17,912 00	1,850 00	1,363 00	7,597 49	57,615 00
Louis Strasser, Columbus	1,570 00	16 00					3,025 00			
Frank Thorne, Columbus										
Columbus Bridge Co., Columbus										
Kaiser & Bro., Columbus	2,000 00	375 00	325 00	350 00	22,000 00	11,000 00	2,200 00	1,593 40	8,870 00	40,420 00
Albert D. Ross, Springfield	1,725 00	50 00	750 00	||	24,700 00	14,225 00	1,845 00	1,363 00	7,597 49	53,183 88
L. N. Philips & E. W. Blair, Columbus	1,765 00	30 00	325 00		3,000 00	16,900 00	1,960 00	1,500 00	7,598 00	61,178 00
Frank P. McCarley, Columbus	956 00	330 00	425 00	475 00	29,000 00	18,000 00	2,000 00	1,370 00	7,240 00	59,776 00
Thos. F. Jones, Columbus	850 00		575 00	||	31,446 00	14,975 00	1,595 00	1,363 00	6,896 00	57,698 00
A. R. Beard & Jos. Balla, Circleville										
Jno. G. Owen, East Saginaw, Mich.					32,000 00		3,000 00	2,000 00	5,000 00	48,200 15
Slade & Kelton, Columbus	1,100 00	600 00	400 00	250 00	30,000 00	15,000 00	1,855 00		6,000 00	
Columbus Machine Co., Columbus										
Louis Fink, Columbus										
Blackwood, Green & Co., Columbus	1,127 95	40 00	221 10	323 90	21,806 21	11,422 17	1,976 93	1,598 55	6,915 00	45,467 28
W. O. Rowe, Westerville	1,520 00	15 00	275 00	275 00	28,311 54	20,000 00	1,595 28	1,363 00	6,046 00	59,600 82
Scott & Downer, Cleveland							2,005 00			
J. Hayden Saddletry Co., Columbus		†	720 00	||	29,020 00	17,000 00	2,600 00	1,690 00	6,500 00	58,980 00
L. Long, Columbus	1,860 00							1,362 00		
W. R. Kline & Co., Columbus	1,940 00	180 00	500 00	500 00	28,500 00	18,000 00	1,900 00	1,600 00	6,100 46	76,849 00
Jno. W. Thompson, Columbus	1,500 00	†	325 00	||	61,777 00	†	1,925 00	1,593 00	6,046 00	72,366 00
Jno. Harding, Columbus	1,998 00									
H. Jones, Columbus	1,525 00	500 00	435 00	325 00	29,000 00	14,500 40	2,100 00	1,900 40	7,000 00	53,400 00
J. Kurtzman, Columbus	1,690 00	400 00	510 00	300 00	28,900 00	13,400 00	2,900 00	1,500 00	6,380 00	53,000 00
J. F. Wagner & Co., Columbus	1,350 00									
Frank Moegner, Columbus	1,500 00	430 00	475 00	260 00	29,000 00	14,000 00	3,000 00	1,430 00	6,000 00	51,481 00
B. Brown & Co., Columbus										

† Included in stone foundation, piers and walls.

|| Included in brick work.

‡ Included in lumber.

The following bids were received for the construction of separate buildings

Name of bidder and post-office.	Swine pens.	Cattle stalls.	Horse stalls.	Power hall.
L. L. Phelps, Westerville	\$9,379 53	.....	.....	.....
Otto Tager, Columbus .....	.....	\$7,040 00	\$34,050 00	\$12,100 00
Martin H. Rauck, Columbus .....	.....	.....	14,471 00	.....

AUGUST 4, 9 A.M., 1885.

On motion of Mr. Levering, it was

Ordered, That Belgium draft horses be classed and allowed to compete with the Percheron and Normans.

Recess until 7:30 p. m., at which time the Board re-assembled.

The minutes of the last meeting were read and approved.

The Secretary read the ad interim report, which was placed on file.

The Assistant Secretary presented a financial statement covering the transactions of the Board from January 1 to July 31, 1885, which on motion of Mr. Foster, was approved and ordered placed on file.

On motion of Mr. Foster, the Secretary was directed to communicate with the Columbus Water Works, relative to water for the new Fair Grounds

On motion of Mr. Foster, the Secretary was authorized to secure, on the best possible terms, a Kemp's manure spreader.

On motion of Mr. Bonham, it was

Voted, That a portion of the manure purchased for the new grounds, be drawn to the plat intended for the race track, and there spread or turned over.

It was

Ordered, That a meeting of the Executive Committee be held on Wednesday, August 19, at 1 o'clock p. m.

On motion of Mr. Foster, it was

Ordered, That the State Fair advertising in city papers and agricultural weeklies be conducted the same as last year.

On motion of Mr. Brigham, the member in charge of the Swine department was authorized to select an expert judge for the Chester Whites, provided the regular Committee does not report.

On motion of Mr. Foster, the matter of putting into shape the engine in power hall and running the same during the Fair, was referred to Mr. Harris with authority to employ a competent engineer.

On motion of Mr. Foster, the sum of \$50.00, or such part thereof as may be necessary, was appropriated to pay the hotel and travelling expenses of speakers on the occasion of the Fair and re-union of State Grange, the selection of speakers to be referred to Mr. Brigham.

Adjourned to meet Tuesday, 8 o'clock a.m., at which time the Board met and proceeded to the transaction of business.

On motion of Mr. Bonham, it was

Ordered, That the contract for furnishing material and erecting the buildings advertised for, be made to Mr. W. O. Rowe, of Westerville, O., provided he give satisfactory bond to complete the buildings by May 1, 1886, and enter into contract regarding such other particulars as may be agreed upon, at his bid of \$45,467.28.

On motion of Mr. Foster, a tube well was ordered placed on the grounds, similar to the one already constructed, the location to be fixed by Messrs. Chamberlain, Hærlin, and Clark.

On motion of Mr. Foster, the expense of lithographing, printing, advertising and issuing the \$60,000 in bonds, was ordered to be paid from the proceeds of said bonds.

A contract between W. O. Rowe and the Board having been prepared was read, and being satisfactory, President Bailey was, on motion of Mr. Foster, authorized to sign it for the Board. The contract to be binding and in full force when a good and acceptable bond, in the sum of thirty thousand dollars shall be presented by Mr. Rowe, that the requirements of the contract will by him be fulfilled. The bondsmen presented to be accepted, if approved by our Trustee, E. K. Stewart.

On motion of Mr. Bonham, it was declared to be the sense of the Board that if H. T. Chittenden will place an 18 foot plank road over the marsh in the extension of Woodward avenue, and cover the same with gravel, to the same depth as the balance of the road, viz., 16 feet wide and 15 inches deep, that the spirit of his contract will be considred filled.

Adjourned to meet at call of President.

COLUMBUS, *August 19, 1885.*

The Executive Committee met at 9 a.m., and viewed the old Fair Grounds to see what was erected in preparation for the Fair.

After the return, Mr. A. P. Stultz, of Zanesville, O., of the Ohio Commission, New Orleans Exposition, having so requested.

On motion of Mr. Foster, it was

Voted, That the Board so far as possible co-operate in influencing county societies and exhibitors to send exhibits to Mr. Stultz, but that the Board incur no responsibility or expense in the matter.

The action of the Secretary on purchase of hay and straw for the Fair was sustained.

On motion of Mr. Foster, it was

Voted, That the Secretary contract with Slade & Kelton to put up for the Board temporary stalls for horses, the same number as last year, charging for use of lumber, labor, etc., at as reasonable rates as can be secured.

It was

Agreed, That ample space in farm product hall be given the Agricultural Experiment Station for its exhibit as requested by Prof. Lazenby, the Director.

Also, that the city water be turned on for use at the Grounds not later than Friday noon, August 28, and Mr. E. K. Stewart be requested to see to the necessary sprinkling of East Broad street, and the drives and track on the Fair Grounds as heretofore.

Also, that the superintendents in the several departments be notified to be here on duty Thursday afternoon, the 27th of August.

Also, that two men sworn in as police be put on as night watch the 21st.

On motion of Mr. Bonham, Messrs. Foster, Levering and Fleming were made a committee to arrange on the best terms possible with Capt. Alexis Keeler for his services as Chief of Police for the Fair, and the employment of policemen, not to exceed 40 in number at \$1.50 per day and dinner.

On motion of Mr. Foster, Messrs. Harris, Levering and Fleming were appointed a committee to confer with Mr. Harris, the manager of the lady riders in relation to races by them during the Fair, the committee being authorized to act.

AUGUST 28, 1885.—8:30 P M.

The Executive Committee met, Mr. Bailey, the President, being absent, Mr. Harris acted as chairman.

On motion of Mr. Foster, it was

Voted, That J. Kinnear, the County Surveyor of Franklin county, be employed to run the lines around the new Fair Grounds and set a permanent corner stone at each corner at as early a day as possible.

Also, on motion of Mr. Levering, that C. Moeser, civil engineer, of Cincinnati, under the direction of Mr. Haerlin, landscape gardener, proceed to lay out the race track according to the rules of the National Trotting Association for half mile tracks.

On motion of Mr. Levering, it was

Voted, That Dr. Doren's request for admission of the pupils of the Imbecile Asylum to the State Fair be granted; those that can walk about the grounds being admitted in company with the necessary attendants, and those that cannot leave the omnibuses and carriages, being permitted to drive through such portions of ground as shall not interfere with the crowds. Also, that the same courtesies be granted to the other asylums that were extended last year.

Mr. J. Kinnear, County Surveyor of Franklin county, having come in to answer and explain the legal steps necessary to establish the lines and corners of the Fair Grounds so that they may not in future be in question.

On motion of Mr. Levering, it was

Voted, That the Secretaries and Mr. Kinnear fix the date of the full survey, and give the necessary notices to the owners of adjoining land.

Also, on motion of Mr. Foster, that a preliminary survey be made at once to fix the four northerly corners of the grounds nearest the proposed half mile track, and that the work of laying out the track as above voted, be postponed until the preliminary survey shall have been made.

Adjourned.

FRIDAY EVENING, *August 28.*

Board met.

On motion of Mr. Foster, the application of Mr. Appleman, President of the Newark Machine Co, for admitting to the Fair his entire force of employes, numbering 150, at a reduced rate. Mr. Appleman to allow them a day to attend, was granted, and the Treasurer authorized to grant Mr. Appleman 150 tickets at 25 cents each.

On motion of Mr. Bonham, it was

Voted, That practical test of hand grenades be allowed inside the race track between the hours of 10 and 12 a.m., subject to the control of the member in charge of the horse department.

On motion of Mr. Bonham, it was

Voted, That the application of Rev. E. H. Gates for space for tent to distribute religious tracts, be referred to the Assistant Secretary with the understanding that he give him usual rates for same space.

On motion of Mr. Foster, it was

Voted, That the regular meal tickets be redeemed at 25 cents, and those in Board's dining room at 50 cents each.

On motion of Mr. Bonham, it was

Ordered, That the poultry judge be instructed to examine Wyandot fowls and award premiums not to exceed the premiums on other fowls if found meritori-

ous, and that entries in this class be kept open until Tuesday evening of the Fair. It was

Voted, That the horse stalls on the New Fair Grounds be erected to conform to the grade established by Mr. H. Haerlin, landscape gardener. The Secretary to notify Terrell & Morris, architects, of the vote.

Adjourned.

STATE AGRICULTURAL ROOMS,
COLUMBUS, OHIO, August 29, 1885.

The Executive Committee met, the full Board not yet being present.

On motion of Mr. Bonham, it was

Voted, That the stubs of the crop correspondents' tickets admit to the grand stand, and that they be not taken up nor a coupon removed for such admission. Also, on motion of Mr. Bonham, that exhibitors' tickets shall not admit to the grand stand. Also that arrangements with a party to sell feed on the Fair Grounds be referred to the Treasurer, and that Mr. Jaeger furnish ice for the fair at 20 cents per cwt. Also (same) that two single complimentaries be furnished to the chief clerk in each State House office. Also that the Treasurer rent the necessary lumber for horse keepers' bunks in the horse stalls.

Adjourned.

AUGUST 31, 1885.

Board met; all present.

On motion of Mr. Brigham, it was

Voted, That Rule 3, page 17, of the Premium List, be construed so as to permit the same cow to compete both for best milk cow and best butter cow, *i. e.*, both in book 25 and 27.

On motion of Mr. Bonham, it was

Voted, That the motion of Mr. Levering, relative to survey, adopted at yesterday's meeting, be rescinded, and the motion of Mr. Foster, relative to county surveyor, be reaffirmed, *viz.*, that the county surveyor run the lines, and fix the corners of the new Fair Grounds.

On motion of Mr. Talcott, it was

Voted, That the Secretary be a delegate of the State Board to the National Dairymen's Convention, at the time of the Fat Stock Show in November; and that the delegates to be appointed by this Board to the National Cattlemen's Association be instructed to act with the Secretary as delegates to the dairymen's convention.

On motion of Mr. Hurst, it was

Voted, That a committee of three be appointed to arrange for the trial of ditching machines, as per offer in the Premium List.

The President named Messrs. Chamberlain and Talcott as that committee.

On motion of Mr. Bonham, it was

Voted, That \$1,000 be appropriated for conducting Farmers' Institutes the coming winter, and that a committee of three be appointed by the chair to act with the Secretary as an advisory committee, and arrange the time, place and details of holding the institutes.

Messrs. Talcott, Pow and Bonham were named as that committee.

On motion of Mr. Hurst, it was

Voted, amended by Mr. Bonham, and passed as amended, as follows: That this Board requests the faculty and trustees of the Ohio State University that they give increased aid this year in conducting the institutes.

Adjourned.

SEPTEMBER 2, 1885.

On motion of Mr. Brigham, it was

Agreed, That the Governor of the State and the Mayor of Columbus be invited to visit the Fair to-morrow afternoon, September 3, and that the President of the Board be the committee to escort them.

On motion of Mr. Bonham, it was

Voted, That it is the sense of this Board that there be no lectures on the grounds except in the halls provided for the purpose.

Adjourned.

SEPTEMBER 4, 1885.

Mr. Foster acting as Secretary. It was

Moved, That the Executive Committee make change in swine pens on the new Fair Grounds in accordance with Mr. Bonham's plans of cement floors and gutters, in place of board floors.

It was moved by Mr. Brigham, that urinals be constructed for each department.

Board adjourned to meet Monday, September 28, at 7 p.m.

COLUMBUS, O., September 29, 1885.

Board met pursuant to adjournment, a quorum not being present the evening of the 28th. All present except Mr. Hurst, who came in shortly afterwards. The minutes of the previous meeting were read and approved. The ad interim report and the financial statement were read and filed.

The protest of W. W. Richardson (on file) against the stallions Tom Rogers and Almont Gift, as not having made the season for mares, was read, and the Board decided, on motion of Mr. Levering, that inasmuch as advertisements had been published by the Central Fair Circuit, omitting the "season" requirements, that the premiums be paid according to the score without regard to the protest.

On motion of Mr. Foster, it was

Voted, That J. W. Stillwell & Co.'s entrance fee (\$34.50) on butter cows be refunded, inasmuch as they were not permitted to show in that class.

On motion of Mr. Levering, it was

Voted, That the Board approve the action of the member in charge of the cattle department in dividing the premiums on polled cattle.

In the case of the protests of Mr. B. C. Pierce on foot rest and on afghan, on motion of Mr. Talcott, after investigation and statement of facts, the awards of the committee were sustained.

On motion of Mr. Foster, the former committee on extension of Eighth street, viz., Messrs. Bailey, Levering and Bonham, together with the Secretary and Assistant Secretary, were made a committee to secure the opening of a street, southerly from the center of the main avenue of the Fair Grounds, parallel with the lot lines of lot 4, 5 and 6, till it strikes the Harbor pike, and also to secure the widening of Woodward avenue, extension from the C., C., C. & I. R'y track to the Harbor pike, to a width of sixty feet, with power to act and instructions to make the expense to the Board as light as is consistent with success in the object to be attained.

On motion of Mr. Foster, the Secretary was instructed to renew all insurance on old Fair Grounds for one year from the date of the expiration of each policy.

Also, to place insurance on buildings on the new grounds to cover all architects estimates to contractor as soon as paid.

On motion of Mr. Levering, the Secretary was instructed to invite responsible firms to put up wind-mills for two wells on the Fair Grounds free of charge to the Board, with a right to put on the maker's name, etc., as an advertisement, the Board to furnish pumps, tanks, etc. Also, that the Secretary at once purchase a land roller and a Kemp's manure spreader at as good terms as possible.

On motion of Mr. Foster, it was

Voted, That the sheep tent be loaned to Judge T. C. Jones, of Delaware, to be used at the Delaware County Stock Sales, to be returned promptly and in good condition.

On motion of Mr. Levering, it was

Voted, That the President name two delegates and two alternates to the National Cattle Growers' Association at Chicago, November 17, the understanding being that the President should himself be one of the delegates.

On motion of Mr. Foster, the secretaries were instructed to issue a Bulletin of the Fair as usual.

The Board adjourned to visit the new fair grounds.

7:30 P.M.

Board convened again. On motion of Mr. Foster, it was

Ordered, That the fair grounds be enclosed by a picket fence; locust posts, not less than 3 inches in diameter at the top, and set 3 feet deep; No. 1 white oak pickets, 1x6 inches, and 6 feet long; 2 oak rails, 2x4 inches, and 12 or 13 feet long; posts 6 feet apart, pickets 3 inches apart; a middle rail or strip of white oak 1x3 inches; the laps of rails and tops of posts to be filled with thick white lead paint.

On motion of Mr. Bonham, it was

Ordered, That the fence, when built, be white-washed at such time as the Board may direct.

On motion of Mr. Foster, the secretaries were instructed to confer with parties owning land adjoining the grounds, relative to paying their proportion of the cost of the fence ordered.

On motion of Mr. Bonham, it was

Agreed, To erect two entrance ways, one at the south-west and one at the south-east corner of the grounds, as per the plans submitted by the architects.

On motion of Mr. Hurst, the secretaries were instructed to notify the C., C., C. & I. R'y Co. relative to the construction of the fence, and request the Company to lay out the location of its track, depot and platforms.

On motion of Mr. Hurst, President Bailey was instructed to visit such localities where such material for fence is gotten out and make the purchase of the material on as good terms as may be.

On motion of Mr. Bonham, it was

Voted, That the architects, in connection with the landscape gardener, be instructed to make a correct plat of the ground occupied by the machine department and divide the same into lots convenient for private machinery building lots, and number the lots.

On motion of Mr. Bonham, the following regulations relative to location and occupation of such buildings were adopted:

Private parties or companies are invited to construct buildings on the new State Fair grounds at once upon the following terms and conditions:

1st. A plan of the building proposed to be erected must be submitted to and approved by the Board and its architects before space will be assigned.

2d. Parties will be given choice of location (among the plats laid out for the purpose) without charge therefor, and in the order of their readiness to erect buildings of approved design.

3d. Buildings so erected shall be the property of the parties so erecting, to be used for the purpose of exhibiting agricultural implements and machines during the fair or other exhibits approved by the Board; but shall not be wholly or in part sold, leased or removed from the grounds without the written consent of the Board of Agriculture.

4th. Parties so erecting buildings shall have the right to occupy them regularly at Fair time for the purposes named, subject to the rules of the Fair.

5th. During the rest of the year, except Fair time, the said buildings shall be under the control, care and protection of the State Board of Agriculture, and the Board will protect them with the same care that it does its own buildings, except insurance, which must be by the owner, if at all.

On motion of Mr. Bonham, amended by Mr. Hurst, it was

Agreed, That those members of the Board who desire, visit the Fat Stock Show at Chicago, November 11, and attend the various conventions held there at that time, or any other fair or exposition they may prefer.

The Executive Committee to meet October 14, evening. Board to meet at call of the President.

On motion of Mr. Bonham, Mr. Terrell, the Architect, and Mr. Fleming, the Assistant Secretary, were appointed a committee to visit Toledo, Sandusky, Louisville, and St. Louis to view buildings preparatory to suggesting plans for a main exhibition building for our grounds.

9 A.M., 30TH.

Mr. Bonham, with Mr. Terrell, the Architect, were made a committee to revise plan of swine pens.

Executive Committee met at 2 p.m., 30th, Mr. Levering in the chair.

Mr. Bonham, of the committee to suggest changes for swine pens, reported that the space laid out for the pens is inadequate, except by omitting the circular and substituting a square show ring, and recommended that change, and that the floors of the pens be made concrete and drained into tanks or cess-pools of sufficient size and number to contain the washings of the entire week of the Fair. The plan was adopted and the architect ordered to prepare plans accordingly.

On motion of Mr. Foster, it was

Agreed, That the fence lumber be surfaced for the south front and up to the railroad depot on the west.

Adjourned.

STATE AGRICULTURAL ROOMS,
COLUMBUS, October 14—7:30 P.M.

The Executive Committee met pursuant to call. In the absence of the President, Mr. Harris was called to the chair.

A delegation of representatives of agricultural implement manufacturers met with the committee to discuss the matter of removing their private exhibition buildings from the old to the new Fair Grounds, and also the erection of new

buildings. The action of the Board at its last meeting in relation to the assigning of space for such buildings was read and met with the endorsement of the representatives present.

After a thorough discussion of the matter, it was, on motion of Mr. Foster, *Agreed*, That in the removal of private machine buildings from the old to the new grounds, the Board shall pay to the parties owning and removing such buildings 50 per cent. of the cost of removal, provided the building be moved to the new grounds and re erected and completed on or before the first day of July, 1886.

On motion of Mr. Bonham, it was

Agreed, That the sum of \$1,000 be offered as premiums for the construction of agricultural machine buildings on the new grounds, and divided as follows: First premium, \$500; second premium, \$300; third premium, \$400. The buildings to be completed on or before the first day of July, 1886. In making the awards the committee to be appointed by the Board to consider adaptation for the purpose, style and general appearance.

Adjourned to meet Thursday morning, 8 o'clock.

Thursday morning at eight o'clock the Committee re-assembled with all members present.

The President submitted a bid from Mr. L. Fry, of Gallipolis, for the furnishing of the necessary white oak fence lumber at \$16 50 per thousand feet, delivered at the Fair Grounds, which, on motion of Mr. Bonham was accepted and the contract accepted with suitable bond.

On motion of Mr. Foster, Superintendent Clark was instructed to have tested the second well drilled on the grounds by Field & Fletcher, and if found satisfactory, payment to be made for the same according to agreement.

Committee adjourned to visit the grounds. Upon return the following action was taken:

On motion of Mr. Foster, Wm. Clark, Superintendent, was ordered to connect the down spouting from the roof of the horse stables where most convenient. Afterwards reconsidered, and the Secretary ordered to make estimates of cost of the above and of cobble paving a surface gutter on each side of the stalls, and submit the estimate to the Board for action November 16.

On motion of Mr. Levering, it was

Voted, That Architects Terrell & Morris develop the plan of the Main Exposition Building submitted and recommended by Mr. Terrell and Mr. J. W. Fleming, as the result of their investigation at St. Louis and Louisville as committee of the Board, it having been adopted by the Executive Committee in its main features. The understanding was that the architects were to submit perspective view and ground plans and estimates complete for inspection of the Board and the Legislature. It was understood on suggestion of Mr. Bonham that the estimates be for clay floor.

On motion of Mr. Bonham, \$150 was voted for trees and shrubbery to be ordered by Mr. H. Haerlin, Landscape Gardener.

The protests of J. McLain Smith and Benton Garringer were referred to Mr. Foster, the member in charge of the cattle department and the Secretary.

On motion of Mr. Bonham, it was

Voted. That the spaces at the east and the west of machinery hall be not assigned for private machinery buildings.

On motion of Mr. Bonham, it was

Voted, That whereas this Board has had money in bank drawing no interest since September 1, ready to pay H. T. Chittenden the \$5,550 due him on land, and, whereas, it would have been paid at that date if his road contract with us for Woodward avenue had been completed, and he was so notified,

therefore, this Board did not consider itself under any obligation to pay interest since that date. Also, second, that we decline to pay any money on the land until the road contract is completed; third, that since the failure to complete the road has been and continues to be a source of serious damage to the Board we shall claim damages in settlement; fourth, that the Board is ready to make immediate and final settlement and payment, itself assuming the completion of the said road for a reasonable consideration, and Messrs. Levering, Foster and Secretary Chamberlain are hereby made a committee and empowered to adjust the matter according to their judgment.

The Secretaries were instructed to present to the Auditor of State an estimate for a special appropriation of \$50,000 for buildings and improvements on the new State Fair Grounds, and state the reasons for asking that sum.

President Bailey and Mr. Bonham were appointed delegates, and Mr. Levering and Mr. Foster alternates to the meeting of the National Cattle Breeders' Association, at Chicago, November 17 and 18. It was

Agreed, That the Secretary make inquiries as to the character of the National Dairymen's Convention, and use his own judgment in regard to attending it as delegate.

The Secretary was instructed to notify the Bodine Roofing Company that their delay in roofing the horse stables is causing us serious damage, and that unless they keep up with the sheeting of the roofs as laid by the carpenters we shall be obliged to provide other roofing.

The next meeting of the Board was called for November 16, at 2 p.m.

Executive Committee adjourned.

The committee appointed to confer with Mr. H. T. Chittenden came to the understanding indicated by the following, which was indorsed by him on the obligation for \$5,550 purchase money held by him against the Board:

INDORSEMENT.

COLUMBUS, *October 16, 1885.*

Received this day on the within contract, from the Ohio State Board of Agriculture, the sum of forty-five hundred dollars, the remaining sum, \$1,050, with the interest accrued to this date, (when all interest stops) is left by agreement in the hands of said Board, with the understanding and agreement that they are to cause to be carried out, as soon as possible, and at the lowest terms attainable, the contract existing between the parties for grading and graveling Woodward avenue, and when such grading and graveling are complete, they are to pay over to said Chittenden the sum remaining in their hands after paying all their bills for such work as agreed to be done.

Signed,

H. T. CHITTENDEN.

It was verbally

Agreed, That Wm. Clark, the Superintendent, should take charge of the work under the direction of the Secretary and on the general plan submitted by him to the committee, keeping an itemized account of all labor and material, and that Messrs. Dixon and Kinnear should continue to furnish the gravel at 70 cents per load, spread, work to begin at once.

The following is the original contract referred to above:

COLUMBUS, O., *March 26, 1884.*

I will sell to the Ohio State Board of Agriculture at the rate of \$1,000 per acre all the land north of Woodward avenue extended (estimating from middle thereof) and east of C., C., & I. R. R.; and if they accept this offer, I

agree to open Woodward avenue from Summit avenue to said railroad, 60 feet wide, and have the same graveled to width at least 16 feet by August 1, 1885. This offer to be good until May 4, 1884. Depth of gravel 15 inches.

H. T. CHITTENDEN.

AGRICULTURAL ROOMS, COLUMBUS, O., *November 16, 1885.*

The Executive Committee met pursuant to call of the President. The minutes were read and approved as recorded.

The *ad interim* report of the Secretary was received and ordered placed on file.

The report of the Road Committee (Chittenden road) was given and accepted, and the committee was continued.

The financial statement was presented and accepted.

The Secretary presented estimates, as required by vote, on cost of disposing of eaves water of horse stables: First, by paving a cobble surface gutter, and second, by utilizing the drainage system and laying additional tiles where needed, viz: about 15 cents per running foot for the cobble and about 6 cents per running foot for the tile, complete with connections, laid. And on motion of Mr. Harris, it was

Voted, That the latter be adopted, and that the Secretary order the proper tile and connections made, and see to having Superintendent Clark put it in properly, as per original vote.

The action of the President, Mr. Bailey, in awarding the contract for fence lumber and posts was approved.

In answer to the protest of Toomey & Co., on award of the Committee on Sulkies at the State Fair, the statement of McMurray & Fisher, with affidavits, was read, and Mr. M. Kling, of Marion, made a statement for the latter firm.

On motion of Mr. Harris, seconded by Mr. Levering, it was

Voted, That the award of the committee be sustained.

Recess to 2 p.m., when it was

Voted, That the secretary advertise and award to the lowest responsible bidder the contract for building the fence around the grounds and the two brick offices and gateways, as per plans and specifications prepared by Messrs. Terrell & Morris, Architects.

AGRICULTURAL ROOMS, *December 2, 8 A.M., 1885.*

The Board met, pursuant to call of the President. All present except Messrs. Hurst, Brigham, Pow and Talcott.

The minutes of the previous meeting were read and approved and ordered placed on file.

The Secretary presented the following report of the Committee at the Ditching Machine contest Marion, Ohio, November 17, 1885:

To the Ohio State Board of Agriculture:

GENTLEMEN: The committee appointed to make awards at the trial of ditching machines, near Marion, Ohio, beginning November 17, makes the following report: The tract of land upon which the trial was made had some seven feet fall in eighty rods, with depressions and elevations to the extent of one foot or more. The surface soil was mostly of a light black character. The subsoil was a rather heavy, waxy clay. There were very few stones. The field had been in corn the past season.

The weather the first day was all that could be desired, and the ground was in excellent condition.

During the afternoon, it was estimated that over five hundred people were present, and the deepest interest was manifested. The trial began about 10 a.m. Lots were drawn for position, and resulted in the Plumb machine taking the first position north, the Indianapolis, the second; the Milner, the third; and the Rennie Elevator, the fourth. These four were all the machines that were present, though five more had entered for the contest by letter. The first two are steam ditchers, the other two are operated by four horses to each machine.

The Plumb ditcher is made by F. Plumb, of Streator, Illinois. The price is \$1,250, and weighs 7,000 lbs. with water in boiler and coal in box. It cuts ten inches wide, and up to fifty one inches deep, and uses about 600 lbs of coal in a day, or to dig 200 rods of ditch. It has its engine and digging parts all together, in one frame, occupying some 6x15 feet, and running on four wire wheels. The digging is done by means of scoops on the circumference of a wheel nine feet in diameter, revolving so that the scoops or shovels gather earth when coming upwards.

When there are no stones it moves steadily along, grading and finishing the ditch as it goes. We came upon them unannounced, and with tape line and watch found it dug a rod in two minutes and forty seconds.

This ditcher leaves the earth perfectly pulverized, all on one side of the ditch so that the tiles can be laid from the other. The grade is kept by a screw adjustment and a line of targets in advance.

While it is far heavier than the horse-power machines, it must be remembered that it only goes over the ground once to complete a ditch, while they go over it many times, and that by using stone-boats under the wheels ditching can be done where horses cannot work. It is a perfect tool for very large farmers or for parties to go out jobbing with on large fields where there are no stones to speak of.

This machine actually dug, altogether, 134 rods in ten hours and twenty minutes, being delayed considerably by stones in one ridge, and by making a turn. Where there were no stones, it dug, in an adjoining field the third day, twenty-one rods and five feet in one hour, stopping four minutes of the time to move stakes, etc.

The Indianapolis ditcher is made by Candler & Taylor, Indianapolis, Ind. The price is \$450, and weight 1,900 pounds.

Although a steam ditcher, it uses any ordinary portable engine to draw it and operate its digging parts. The digging is done by an endless chain of scoops running over revolving drums.

Its medium speed is six feet a minute. Unfortunately, this digger broke down, disabling it for the day, after digging a few rods. It is a newly invented machine, but gives promise of doing excellent work in soils free from stones, or reasonably so. What little ditch it dug was nicely done.

The Milner digger is made by Moses Milner, of Leesburg, Highland county, Ohio. The price is \$250, weight 1,400 pounds, and it cuts up to forty inches deep, and from eight to fourteen inches wide. It makes a ditch by passing back and forth, taking about two inches of dirt each time. A large heavy wheel packs the earth into its concave face, from which it is removed by a scraper, and thrown to one side after it has reached the top, and when passing the other way to the other side. It has a share which separates the earth as it is being taken up, also cutters worked by an eccentric which aid in lifting the earth out of the ditch. There are no cog wheels, belts or chains. Four horses seemed to handle it with ease. A driver was required, and the man to manage the machine. It has no system of grading such as the Plumb has, but a careful operator could take out nearly all the earth from the ditch so that but little hand grading would be required. Where the fall was abundant the machine might grade accurately enough to receive the tiles. Both this machine and the Rennie Elevator will take out the bulk of the earth about ten times as fast as an ordinary hand would. Farmers may rely upon this. The Milner digger would probably be injured more in very stony ground than the Rennie, on account of its cutting flanges being thin and sharp, but it is to this peculiarity that it owes its lightness of draft.

It should be said that this ditcher was only patented in 1884, and hence there has not been time to find out and strengthen all its weak points. A slight breakage obliged it to stop before it had quite completed its ditch, and it thus lost its chance for a prize; but your committee think it deserving of very favorable mention on account of its light weight and draft and low price. When fully perfected it will be a desirable ditcher for the ordinary farmer. It dug seventy-two rods in two hours

and five minutes, but did not quite complete the ditch on account of the before mentioned breakage.

The Rennie or Elevator ditcher is made by the Elevator Ditching Machine Company, of Newark, Ohio. The price is \$325, the weight 1,500 pounds, and it cuts up to forty inches deep. Its regular cut is about eight inches, and will take a six-inch tile, but it can be made wide enough, it is claimed, to take an eight inch pipe. It is a thoroughly perfected implement. It has been in use many years, and every weak point has, apparently, been found and strengthened. It is a repeating machine, the same as the Milner, that is, it makes its ditch by passing back and forth and taking a layer of dirt each time. It is a very strong machine, and was the best one at the contest for very stony ground. The owners claim that it has never broken down. It certainly did not here; but the draft, as it was handled here, to make time, seemed to us excessive for four horses. Two splendid heavy teams, of at least 1,400 pound horses, were attached to it, but they got very tired.

If not crowded so fast, two ordinary farm teams could handle it. It is quite similar in size and shape to the Milner, occupying some six or seven feet square. The digging is done by an elevator wheel and connected parts, supported under a sulky.

When the digging parts are raised up by its lever and ratchet, it can be transported as easily as a common wagon, as can also the Milner machine. A wheel in the rear gauges the depth, so that the operator can take more or less dirt, at his option. The horses can be driven and the machine operated both by one man, but it would be better to have two. It is said to be pretty much all made of steel. It has no cogs in the working parts, and there are no belts or chains. Like the Milner, it was no system of grading, all depending on the eye and skill of the operator. It dug 68 rods in 5 hours and 44 minutes.

[NOTE.—The average time of the Rennie machine was one rod in 5 minutes and 5 seconds. Average time of the Plumb machine, first day, one rod in 5 minutes; second day, one rod in 4 minutes; average of both days, one rod in 4 minutes and 38 seconds.—W. I. C., *Sec'y.*]

On the second day no digging was done on account of the rain. All the parties were requested, but not required, to continue the trial on the third day. The Plumb came out and dug in another lot where it was not so muddy, finishing fifty rods of ditch, including a curve, in three hours and twenty minutes. The trial was then declared completed, and the following is the unanimous award of your committee: The first prize to the Plumb. The second to the Rennie Elevator.

Below are our unanimous markings:

Scale of points.		Names of machines.			
		Plumb.	Indianapolis.	Milner.	Rennie or Elevator.
Rapidity of digging.....	15 points	15	.....	.....	.....
Excellence of work, not including grade.....	10 "	.....	.....	10	.....
Accuracy of grading	15 "	15	.....	.....	.....
Excellence of finish for receiving tile.....	5 "	.....	.....	.....	5
Simplicity of mechanism	10 "	.....	.....	.....	10
Durability of machine	10 "	.....	.....	.....	10
Ease of transporting and handling	10 "	.....	.....	.....	10
Lightness of draft in proportion to work done	10 "	.....	.....	10	.....
Best condition of earth thrown out for refilling	5 "	5	.....	.....	.....
Least damage to surface soil in digging	10 "	10	.....	.....	.....
Totals.....	100 "	45	.....	20	35

A. H. KLING, <i>Chairman</i> ,	} Committee.
T. B. TERRY, <i>Secretary</i> ,	
FELIX REBER,	
S. N. TITUS,	
B. CUSICK,	

The following protest was filed by the manufacturers of the Rennie or Elevator Ditcher:

OFFICE OF THE ELEVATOR DITCHING MACHINE COMPANY,
NEWARK, OHIO, November 24, 1885.

To the Ohio State Board of Agriculture:

GENTLEMEN.—We respectfully desire to enter our protest to the report and award of the Committee on Ditching Machine Contest, held at Marion, Ohio, last week, and beg to offer the following reasons in support of our position. It might be well to state that all the machines were assigned positions by lot, in a field that had been in corn the past season, and which averaged about 75 rods across. It was our distinct understanding that one ditch dug across the field was to complete the test, and it was so understood by all the competitors. At 5 p. m. we had our ditch completed, and it was the only ditch finished by any machine that day. Moreover, the Rennie was the only machine that did not break down in a single part during the test.

As to the points awarded, we protest:

1. *Rapidity of Digging.*—The entire 15 points were awarded to the Plumb Machine. On the second day, which was very rainy, no machines worked and the Committee at that time examined the construction of the machines and the ditches which had been dug the day before. It was then that a member of the Committee stated to our Mr. Thomas, "that at the meeting of the Committee the evening before, computations were made as to which machine had dug the fastest, and that the Rennie was slightly ahead of the Plumb in this respect, although they had made the mistake of computing our ditch at 64 rods, whereas we had dug 68 rods." We immediately called the attention of Mr. Chamberlain to this error and he promised to have it rectified, which would make our time per rod still faster. [NOTE.—The correct figures are given in the Committee's Report. No accurate measurements were taken the first day, and the computations that night could not, therefore, be accurate or final. —W. I. C., Sec'y.] The only day we were in the contest we dug 68 rods, which averaged 3 feet deep, in 5 hours and 44 minutes, or a little over $11\frac{1}{2}$ rods per hour. The Plumb Machine dug 80 rods in 7 hours and 30 minutes, or an average of less than 11 rods per hour, and there were several rods of their ditch scarcely one foot in depth, where the machine had to be raised to pass over the stones in the soil.

The Plumb Machine was allowed to dig a ditch in another place on the third day in a sod field where there were no stones, and after the soil had been made much easier to dig by reason of 36 hours almost constant rain. Their whole length of both ditches combined was taken, and in this way averaged the fastest. It was rainy on this day, and we could not have procured horses had we so desired, and the Plumb was the only machine at work. We protest, because on the first ditch we were the fastest, and it was certainly understood at the commencement of the trial that the one ditch would end it.

2. *Accuracy of Grading.*—In this regard the Plumb was awarded the entire fifteen points. We protest, claiming to have obtained the best grade on the only day we competed, and as good as the Plumb made at their subsequent trial. The night after the first ditches were dug, it rained steadily, and when the Committee examined the ditches, water was running in them. One rod only of our ditch showed four inches depth of water, and that could have been remedied by the machine had we had horses at hand. With this exception we had a beautiful grade with a flow of water not over an inch deep the entire length of the ditch. In the ditch dug by the Plumb machine there was a long distance in which there was twenty-two inches of water, and a number of men were put to work to dig the high places off, so as to let the water out, but did not succeed in getting it lower than twelve inches by three o'clock on the afternoon of the third day.

It is but just, however, to state that this 22 inches of water was occasioned by the machine not being able to dig part of the ditch on account of stones. But it should be borne in mind that the Rennie machine also encountered as many stones, but still dug the ditch. The committee, in its report, states that we "have no system of grading, depending entirely on the eye and skill of the operator." This certainly does our machine great injustice, for we have a system of grading by means of raising and lowering the cutting plow, with graduating stops, operated at the will of the operator. It is a positive result of mechanical effect contained within the machine itself that secures to us a good grade under all circumstances, which we could explain more fully did space permit. To show how little the committee looked into our grading device, and what little attention was paid to our full explanation of it to them, the report states: "A wheel in the rear gauges the depth, so that the operator can take more

or less dirt as his option." Now, this wheel has nothing, in the slightest degree, to do with "gauging the depth" or grading, which is all done by the plow, as we fully explained to the committee when they examined the machine. The best proof of the grading capability of the Rennie was the ditch we dug, which speaks for itself. At your former Field Trial of Ditching Machines, held in May, 1884, when the Rennie secured First Prize, a distinguished committee divided "accuracy of grade" equally between the Plum and the Rennie machine.

We could present many other points of superiority of the Rennie machine for farmers' and ditchers' use, but make protest against the award on the points of rapidity of digging and accuracy of grade as above set forth.

Very respectfully,

THE ELEVATOR DITCHING MACHINE CO.,
Manufacturers of the Rennie's Elevator Ditching Machine.

This protest was sent to the Committee of Award and brought the following supplementary statement:

To the Ohio State Board of Agriculture:

GENTLEMEN.—Your Committee on Awards, at the Marion Ditching Trial, wish to say to you briefly:

1st. That no promises or agreement was ever made by us that one ditch across the field should end the contest.

2d. That all the contestants cordially agreed to the decision of the committee, that those who chose could dig more ditch Thursday, and that the ditch then dug should count; and we consider that we had a perfect right to so decide, any way.

3d. That rapidity was a simple question of fact, and the facts were as stated in our report. [NOTE.—The timing was by two members of the committee. The main measurements were by a civil engineer.—W. I. C., Sec'y.]

4th. That accuracy of grade is, as we understand it, a question of judgment, and the judgment of your committee was unanimous.

5th. That questions of price, weight, etc., could not come in the marking, except when there specified, but were fully covered in the written part of the report.

Committee.—A. H. Kling, *Chairman*, T. B. Terry, *Secretary*, B. Cusick, F. Reber.
[Mr. Titus, the fifth member, could not be seen in time for his signature.]

The Board, at its meeting, December 2, 1885, sustained the decision of the Committee.

It having appeared from the financial statement that the improvements now under contract and those now in progress on the new grounds will require some \$12,000 to \$15,000 more money than we now have in bank or State Treasury, on motion of Mr. Foster, it was

Voted, That the President, Treasurer and Mr. L. B. Harris be a committee to negotiate in regard to the sale of the \$20,000 additional bonds the Board is authorized to issue by law, and to report to the Board.

The committee having reported their conference with the parties who took the first \$60,000 of the bonds, on motion of Mr. Foster, it was

Voted, That in order to continue the improvements on the State Fair Grounds, owned by the State Board of Agriculture, the Board deems it expedient and necessary to borrow \$20,000 more and to issue bonds therefor under the same authority and of the same tenor, denominations and rate of interest, and denomination and number of coupons, and the same in the details of their issue as described in the resolutions relative to issuing the first mortgage bonds of this Board for \$60,000, except as authority is hereinafter given to vary from the same, and to secure the payment of the principal and interest of the said bonds by a second mortgage upon the said Fair Grounds.

Resolved, Second—That the same committee, to-wit, the President and the Treasurer of this Board, and Mr. L. B. Harris, one of its members, be authorized to arrange the details, negotiate and issue the said \$20,000 of second

mortgage bonds, varying from the form and details of the issue of the first mortgage bonds only so far as is authorized by the law authorizing the issue of bonds by this Board, and so far as, in their judgment, is necessary under the circumstances of the case.

The Secretary reported that, under authority of the resolution, he had advertised and received the following bids for construction of fence and gateways:

Names of bidders.	Rough— 6,500 feet.	Planed, etc.— 2,720 feet.	Total fence.	En- trances.	Total bid.
W. O. Rowe	5 cts. per ft.	10 cts. per ft.	\$597 00	\$1,820	\$2,417 00
E. W. Blair	8 cts. per ft.	16½ cts. per ft.	968 80	1,640	2,608 80
Wm. King	*	*	599 20	1,582	2,181 30
Michael Harding	†	†	1,267 75	.....	.....
Jas. Clark .....	.....	110 cts. per rd.	534 00	.....	.....

* 6½ cts. all around. † 13¾ cts. all around.

Also, that he had let the contract to Wm. King, the lowest bidder on the entire job, he having given satisfactory bond.

On motion of Mr. Foster, the above action was approved.

On motion of Mr. Levering, it was

Ordered, That the south fence of the Fair Grounds be built on the exact line of the State Fair Grounds, and that the committee on widening Woodward avenue be instructed to urge the county commissioners and the viewers by them appointed to widen Woodward avenue ten feet to the south, instead of five feet on each side.

The following proposition from Mr. Maxwell Innis was then presented:

To the State Board of Agriculture:

I will rent you necessary land, not to exceed one acre, for you to place your manure pile on—the south-east corner of my lot—for \$10 per year for five years, provided I be not held responsible for damages by cattle or stock from the gates being left open by the employes of the Board.

MAXWEKL P. INNIS.

I will also give the above five years' use of the land (\$50 in value) as my part of the line fence, and will remove the old rail fence from the entire line, building it one rod off and leaving it till the grading is done and the new fence is completed, provided I then have all the old rails as my own.

MAXWELL P. INNIS.

On motion of Mr. Foster, this proposition was accepted by the Board, provided Mr. Innis will fence off the said were on the two sides not adjacent to the Fair Grounds with a good and substantial fence, and maintain the said fence in good repair for the five years of the lease. (Note.—Mr. Innis afterwards agreed to this.)

Benton Garringer, of Washington C. H., was given a full hearing in regard to what he deemed an injustice done him at the State Fair.

On motion of Mr. Bonham, the action of the member in charge of the cattle department and of the awarding committee was sustained.

On motion of Mr. Foster, it was

Ordered, That no gravel be hauled to the grounds hereafter except when the grounds are frozen or so that the grounds will not be cut up.

On motion of Mr. Bonham the settlement of the Woodward avenue improvement with Mr. H. T. Chittenden was referred to the original committee.

A committee from the Archæological and Historical Society came in to consult with the Board in regard to an Ohio Centennial Exhibit in connection with the State Fair of 1888, and on motion of Mr. Harris, the chair was authorized to appoint a committee of conference in regard to the matter. The chair appointed Messrs. Bonham, Foster and Fleming.

On motion of Mr. Foster, it was

Voted, That all work on the Fair Grounds except that under contract be suspended, except the necessary work on the speed ring, and other work ordered and incomplete and subject to damage from immediate suspension.

On motion of Mr. Foster the President and Treasurer with the Secretaries were made a committee to confer with the proper officials of the C., C., C. & I. R'y Co., and locate the fence along our line and theirs, leaving necessary room for depot platforms, etc., according to our contract with that company.

The Secretaries were instructed to confer with Dr. J. W. Hamilton in regard to leasing for a term of years a strip of his land east of the horse stables, for hitching ground at fair time.

Board adjourned subject to call of the President.

STATE AGRICULTURAL ROOMS, COLUMBUS, O., Jan. 12, 1886.

The Board met pursuant to the call of the President. All present except Mr. Hurst. The minutes of the previous meeting were read and approved.

The President appointed as Committee on Essays, Messrs. Levering, Talcott and Brigham, and as Auditing Committee, Messrs. Harris, Pow and Shields.

On motion of Mr. Shields, it was

Voted, That the Board call on Governor Foraker, and pay its respects, and that he be invited to appear at the opening of the Annual Convention, and extend a welcome to the delegates. The call was forthwith made, and the invitation extended and accepted.

The Committee on Roads reported that the viewers for the widening of Woodward avenue had reported to the commissioners in favor of widening it ten feet towards the south, and had assessed compensation and damages aggregating less than \$150, and the viewers for the new road south from our main carriage gate were believed to have reported to the commissioners in favor of the route and termini asked for by the Board, and had assessed compensation and damages fairly and so that the commissioners would be likely to open the road and pay costs. Report accepted and committed continued.

The committee on issue of bonds, reported that additional legislation was needed before the bonds could be floated, and explained the reason therefore.

The report was received and the committee was continued.

The committee to confer with the C., C., C. & I. R'y Co., reported the fence as located.

The report was accepted and the committee continued until the final contract with the said company should be executed.

The committee to confer with Dr. J. W. Hamilton reported no progress or probability of renting land from him, and the committee was continued and instructed to make the same effort with Mr. Maxwell Innis.

On motion of Mr. Foster, C. Aultman & Co. were allowed to set their building high enough to bring the bottom of the sills even with the top of the ground.

Adjourned to 9 a.m. Wednesday, at which time the Board again met and

proceeded to business by reading the minutes of the previous day which were approved.

The annual financial statement was read, and the report of the auditing committee as recorded in the Journal, presented.

Report accepted and the committee discharged.

The committee on Essays submitted the following, which was adopted :

“The committee on Essays beg leave to make the following report: Four essays on butter making were offered for our consideration, and all of them were almost models of practical perfection, fairly fulfilling in letter and spirit, the requirements of the premium offered.

“After due consideration, we have awarded the premium to Mrs. N. L. Smith, of Lindenville, Ohio. We commend especial attention to the essay by Mr. Geo. Stanly, for its thorough instruction in the manufacture of farm dairy butter, combining, in our judgment, the best rules of the present age for its manufacture. The implements recommended by him ought to receive general adoption.

“We further recommend that all the essays submitted, be published in order that their different points of excellence may be made known.”

[Signed.]

JNO. C. LEVERING,
J. H. BRIGHAM,
HENRY TALCOTT.

On motion of Mr. Foster, President Bailey and Messrs. Bonham and Brigham were constituted a committee to wait upon the Governor and invite him to the Agricultural Convention to be convened in the Senate Chamber.

The committee from the State Horticultural Society was requested to meet with the Board in Convention, and prepare resolutions relative to appropriations for State Fair Grounds.

Messrs. Talcott and Pow were appointed a committee to draft resolutions on bogus butter.

The Secretary was directed to request representatives from the Board of Trustees of the State University to meet with the Board of Agriculture for consultation in regard to State appropriation.

Board adjourned to meet in State Convention, January 13, 1886.

Attest:

W. I. CHAMBERLAIN, *Secretary.*

PROCEEDINGS
OF THE
FORTY-FIRST ANNUAL SESSION
OF THE
OHIO STATE AGRICULTURAL CONVENTION,

*Held in the Senate Chamber, at Columbus, Ohio, Wednesday,
January 13th, 1886.*

MORNING SESSION, 11 A. M.

The Convention was called to order at 11 A. M. by President C. D. Bailey. Governor Foraker being present, was introduced, and spoke as follows:

Gentlemen, I have not come here for the purpose of making a speech. I supposed when I came to Columbus, that Gen. Kennedy would occupy this part of the State House. I came in this morning only because I was kindly invited to do so, for the purpose of bidding the gentlemen who constitute this Convention a hearty welcome, as we all do, to the city of Columbus. I may be permitted, however, to say that I have a high appreciation of the importance of the interest which you are here to represent; which goes without the saying, because it has been the observation of everybody that there is no interest so important to us in this country as the agricultural interest. We all know that, not only from observation, but also from statistics; and some of us have a high and proper appreciation of it from experience as well. I shall always remember with a great deal of pleasure that I once had the honor and the right of classing myself of that number; and it has always been, in one sense at least, a matter of very great regret, that I should have ever parted with that privilege; for by and by I got away from the farm, and have been steadily going from bad to worse until I have landed at last in the Governor's office.

But you have come to represent this interest, and it is entirely proper that you should do so. Every other interest is organized. We live in a day of organization; the railroads are organized; the manufacturing interests are organized; the commercial interests are organized; agriculture should be organized, I think the gentlemen here who are interested in the growing of wool appreciate that fact. What they have learned in that respect the farmer is learning in regard to wheat, and everything else that pertains to agriculture. There are many senses in which it is profitable. You ought to be organized not simply to see that you have your rights guarded by legislation, but that you may study what kind of legislation is calculated to promote agricultural interests. I remember when I was a boy on the farm we had a good many difficulties to con-

tend with aside from drouht and wet weather. We had the old-fashioned cut worm, which made it necessary sometimes to replant; but we did not have the potato bug and many other insects which you now have. I don't know whether their coming is due to the fact that we have these entomological societies for the study of bugology or not. I don't suppose it is due to that fact. But we do know their use. It is the appropriate office of associations of this kind, and that is why we should have them, to study in what way farmers can be protected against the ravages of such insects, and other enemies that continually beset them. When you have made a study of this matter, when you have learned how they may be provided against, you will know what sort of legislation to recommend to the legislature.

I hope that during your deliberations here you may enjoy yourselves, and that you may be able to agree upon and recommend that to the other departments of the State which will be calculated to further the important interests you represent.

Thanking you for the compliment of asking me to come and meet you here, and wishing you all honor and success, I bid you good morning.

The Chair appointed the following committee on Order of Business: R. Baker, Dr. Hazzard and L. N. Bonham.

The Chair announced that the next thing in order was the call of the roll. The Secretary proceeded with the call of the counties, the following delegates being found present:

Allen.....	J. B. Roberts.	Knox.....	C. A. Young.
Ashtabula.....	E. G. Hurlburt.	Lake.....	J. H. Wood.
Athens.....	J. S. Higgins.	Logan.....	Thos. Cook.
Auglaize.....	J. A. Werst.	Lorain.....	R. Baker.
Belmont.....	J. B. Hogue.	Mahoning.....	Jas. Sears.
Butler.....	Peter Murphy.	Marion.....	D. H. Harvey.
Champaign.....	C. H. Ganson.	Medina.....	Wm. Witter.
Clarke.....	J. S. R. Hazzard.	Miami.....	F. B. McNeal.
Clinton.....	Leo Weltz.	Morgan.....	E. R. Swayne.
Columbiana.....	G. F. Copeland.	Morrow.....	J. G. Russell.
Coshocton.....	Lewis Demoss.	Muskingum.....	H. C. Chappelleers.
Crawford.....	E. B. Monnett.	Noble.....	Jno. W. Petty.
Cuyahoga.....	T. W. Scott.	Perry.....	L. A. Dean.
Darke.....	H. Coblentz.	Prettle.....	W. H. Schneider.
Delaware.....	J. T. Hutchisson.	Putnam.....	Geo. H. Knupps.
Erie.....	T. B. Taylor.	Richland.....	M. Carter.
Franklin.....	Moses H. Neil.	Sandusky.....	Wm. B. Kridler, jr.
Fulton.....	L. G. Ely.	Seneca.....	W. S. Cramer.
Gallia.....	C. D. Bailey.	Shelby.....	Isaac Betts.
Geauga.....	H. L. Hale.	Stark.....	J. F. Neisz.
Guernsey.....	V. D. Craig.	Summit.....	Peter Lepper.
Hamilton.....	Albert French.	Trumbull.....	S. R. Chryst.
Hancock.....	D. B. Beardsley.	Tuscarawas.....	F. Ankney.
Hardin.....	G. P. Frame.	Union.....	Dyer Reed.
Harrison.....	Andrew Smith.	Warren.....	W. T. Whitaker.
Hocking.....	Maynard Pond.	Washington.....	Jno. Stricker, jr.
Holmes.....	J. J. Sullivan.	Williams.....	E. G. Fay.
Huron.....	J. F. Randolph, jr.	Wyandot.....	L. B. Harris.
Jefferson.....	G. Z. Burris.		

On motion of Hon. Peter Murphy, the Sergeant-at-Arms of the Senate was requested to act as Sergeant-at-Arms of the Convention.

A MEMBER.—I move that a committee of three be appointed on resolutions to report to this Convention immediately. The motion being seconded, was agreed to. The Chair appointed F. B. McNeal, S. H. Hurst, and Hon. Peter Murphy.

The annual address of the President was then read, as follows :

ANNUAL ADDRESS.

GENTLEMEN OF THE CONVENTION: Agreeable to law, it becomes my duty to preside over this, the Forty-first Annual Session of the State Agricultural Convention, convened for the purpose of suggesting measures and formulating plans for the fostering, protection and promotion of that great interest through which all other interests live and are extended, and from a precedent established by the long line of my distinguished and eminently qualified predecessors, I may be expected to refer briefly to the agriculture of our State, but more particularly to render an account of the State Board's stewardship for the year just past. I welcome and greet you as friends interested in a common cause, and also as the duly authorized representatives from your respective agricultural societies.

The business that calls us together to-day is of such vital importance to the people of this State as to demand the exercise of our best judgment in recommending or passing upon any measure presented for consideration, and I hope that when the work of this call shall have been completed, each delegate will be able to carry home with him some new thought to stimulate his constituency to fresh exertion in the fields of agricultural labor, and that good results may be manifest throughout the State.

The past year may, in some respects, have been discouraging to the tillers of the soil and the feeders of stock, occasioned by the great shortage in our wheat crop and the average low price prevailing, together with the diseases that threatened our cattle and hogs, making the business of rearing and fattening uncertain, and consequently unprofitable, but on the other hand we have been blessed by the largest corn product for a number of years; an oat crop rarely equalled in area and bushels per acre, while other products of the diversified agriculture of our State have yielded comparatively well, and the farmers of the State, as a whole, have reason to be thankful. Unlike some other States, we depend not wholly upon any one crop or any particular branch of agriculture for success; the character of our soil and climate, and the location of the State in the center of the great lines of transportation, making it possible to grow with success and profit the numerous crops for which the State is noted, so that with the failure of any one the farmer is not bankrupt or the State ostracized. This, my friends, is why Ohio has earned the honor of being the best State in the Union; and her farmers, as a class, the most independent, a situation of which we may well feel proud, and another cause why we should feel thankful, even in the face of an occasional shortage in some particular product.

The Ohio farmer of to-day who feels like complaining at what may seem reverses, and is dissatisfied and sorely vexed with his lot, has but to turn back the pages of history for a few years and compare the condition and advantages of the farmer of the past with those of the farmer of the present, and his vexations and complaints will take wings and soon be out of sight. The men of only a few years past, who drove the entering wedges for successful agriculture in Ohio, had difficulties to contend with on all sides, besides danger and disasters, and their only reward was a bare livelihood for themselves and families, and the hope of increased value in lands and comforts in living as they increased in age, strengthened with the hope of providing better opportunities and surroundings for their children in years to come. They had neither the conveniences for labor or pleasure; a poor market in which to sell or trade their produce, and still poorer means of getting it there. They had not the benefits of knowledge based on experience and practice, such as emanates from the

various agricultural societies now in existence, but every man was compelled to rely solely upon his own knowledge and resources, and dig and delve as best he could, adapting themselves to what would seem to us now, most undesirable circumstances.

The Ohio farmer of to-day has placed at his disposal every convenience to lighten labor and make life a pleasure. His surroundings are the best, his home comforts equal, in fact, superior to those of men in other callings and professions; the educational advantages for his children are such as to fit them for any walk in life, while for the disposal of his products the very best markets of the world are brought to his door by the nearly 7,000 miles of railway interwoven into the State, leading to connections for every quarter of the globe. Besides these great advantages, he has, in the solving of vexed questions, or in antagonizing measures that may be operating against his interests, the aid and co-operation of the various associations that have been organized to protect and promote the Ohio farmers interests. To-day there are in Ohio, guarding the interests of the farmer and breeder, and promoting agriculture to the interest of the whole people, various organizations of which I might mention the Shorthorn Breeders' Association, the Jersey Cattle Club, State Swine Breeders' Association, Sheep Breeders', Wool Growers', Bee Keepers', Horticultural and other associations, besides the State Board of Agriculture, the county agricultural society, and more recently the State Forestry Bureau and the Ohio Cattle Commission.

The influence of these organizations is being felt in every department of the various branches of farm industry; not a question arising or a point to be made affecting these interests that does not receive the consideration and push necessary to securing the objects sought to be attained.

These associations are fighting the business battles of the individual farmer, and where individual effort would fail, organized effort generally succeeds. I am frank to say, however, that the average farmer does not appreciate as he should the efforts of these associations and the objects of their formation, otherwise the membership in each would be over-crowded and their treasuries would be supplied, at but a trifling fee for each member, with an abundance of money to prosecute any work for the advancement of the farming interests.

I should like to see these organizations brought into closer relations with the general farmer, and the proceedings of each, especially the valuable discussions that are had and the papers read, published so profusely that copies could be placed in the hands of every farmer in the State. Could this be done, there would be no lack of either membership or funds.

For a few months past dreaded diseases have threatened to invade the State and lay hold upon certain classes of our live stock. The Live Stock Commission has had this matter in charge and have been laboring diligently, with their limited means, to prevent any such occurrence. You will, I presume, hear from the Commission during this Convention.

And now, gentlemen of the Convention, permit me to refer more particularly to the work of the State Board of Agriculture for the past year, and let me assure you that its work has not been insignificant or its members idle.

The Farmers' Institutes, for the season, were begun early in the winter of 1884, and continued with but slight interruption until the month of March, 1885. They were held in many different localities of the State, the principal lecturers being engaged and paid by the State Board, with some assistance from the State University and the State Horticultural Society. The Secretary reports a generally good attendance and an increased interest among the farmers and others who attend. The Farmers' Institutes, though of recent date, are now thoroughly established, and I believe the State Board should be

relieved, as far as possible from the responsibility of their success. The County Agricultural Societies should take a decided hand in these matters, and make them county affairs as near as can be. The people of the county should be made to feel that it is their home institution, not in the sense of filling the house with eager listeners, but in supplying the platform by calling upon their practical men to prepare papers and deliver addresses, giving the result of their labors and investigations on the farm. This will awake many from their slumbers and they will become more enthusiastic in their investigations, as well as independent of foreign assistance. The mission of the State Board is not to stand still, so being relieved to any extent in one direction, its efforts will be spent to the extent relieved, in some new direction or new work that is requiring attention to enlighten and benefit the farmer. I believe these institutions have already been productive of much good and the County Agricultural Societies should see to it that they become permanent as well as successful institutions.

The publication of crop and stock reports has been continued in the same manner as heretofore. The information upon which these reports are based, is furnished by correspondents in the several townships, who serve their country for the country's good. They are, as a rule, practical farmers, whose judgment in relation to crops and stock can be relied upon. The preparation of these reports and their distribution costs much time and labor, as well as expense, but the benefits derived from them to the farmers of Ohio, justifies the outlay.

Commercial fertilizers are now well known in Ohio, and the inspection and analyses, under the law passed March 6, 1881, of those sold in Ohio, and the publication of the result, is an advantage of decided value to the farmer. Considerable time and labor has been spent in this direction, but good results have followed and the work will be continued.

The State Fair, held the first week in September, fully equaled the expectation of the Board and the friends generally of that institution. The number and character of the exhibits in the several departments clearly demonstrating that the State Fair is growing in importance, and is becoming more and more a recognized and positive factor in advancing the agricultural and mechanical interests of the State. In the arrangement of the premium list for the past few years, and the adoption of rules and regulations governing the fair, your Board has entirely lost sight of quantity as a consideration, and has worked solely with a view to quality. Every discouragement has been given to animals and other exhibits of an inferior character, while the greatest possible inducements have been extended to those of superior worth and merit, the result being that every department of the Fair has been characterized by a class of exhibits representing only the best, and such as are calculated to benefit the people by showing to what an extent of perfection any class of animals can be brought, to what uses steam and horse power machinery can be placed in the work of the farm and the utilizing of waste forces and material; how successfully crops can be grown and to what extent the domestic arts and sciences can be practiced to our profit, health and convenience. The Fair of 1885 was liberally patronized by all classes of our citizens, and I venture the assertion that there was no class left the grounds without having seen and examined something from which they gained knowledge or information that was of practical benefit, that would in turn benefit the community in which they lived, and ultimately, though perhaps indirectly, the whole State.

The State Fair has passed its infant age, and arrived at that point of life where it wields a beneficial influence in molding the character of younger industrial associations that have sprung up in every county to advocate and

foster the interests we represent, and which are so essential to the people of the State and to every business pursuit.

For the present advantages we enjoy in the good resulting from the State Fair and its kindred associations, we are indebted to the earlier members of the State Board, the fathers of the fair, who by their persistent efforts and careful training, reared this institution, of which to-day the people of the State feel proud and honored. Some of these men come to this Convention year after year, and it is a pleasure to see their faces and be benefited by their experience. Occasionally, but surely, a face is missing. They are passing over the river to their reward, but a monument has been erected to their memories, that each year grows larger in proportions and the inscription more brightly and clearly defined.

I desire now to remind this Convention, that the State Board of Agriculture of 1883, viewing with pride the growing propensities of the State Fair, deemed it wise and expedient, as well as necessary, to take the initiatory steps toward establishing it on permanent grounds, that should be owned by the State and that could be better fitted up to suit the purpose and the growing demands. The first thing, of course, was the securing of land, which you have heretofore been informed was done, but inasmuch as the work of establishing the fair on grounds owned by the State is now fairly under way, I submit to you a more detailed account of the matters connected therewith. The purchase of the following parcels of land were made by and with the authority of the Board. They are located in Clinton Township, only two and one-fourth miles from this State House, and directly along the line of the Cleveland, Columbus, Cincinnati & Indianapolis Railway. Parcels one, two, three and four, to which your attention will be called, were purchased by W. N. Cowden and L. B. Harris, as trustees in trust for the Ohio State Board of Agriculture. The former being then President and the latter Treasurer of the Board. These purchases were so made, pending the enactment of a law authorizing the Board to purchase and hold real estate for State Fair purposes. The General Assembly of Ohio on March 25th, 1884, passed such a law, and the parcels of land purchased thereafter, were deeded directly to the Board. In June, 1885, the trustees in trust executed a deed to the Board of the parcels purchased and recorded in their names. About July 1st, 1885, all mortgages and notes held by persons for deferred payments on the lands, and assumed by the Board in the purchases, were paid or arranged for payment, and a first mortgage was then executed on the whole to E. K. Stewart, trustee for the bond holders, to secure the payment of bonds issued, in accordance with the act of the Legislature, passed May 1st, 1885. The first parcel of land purchased, was from Thomas Cassidy, and consisted of forty-five acres, located on the south side of the Neil and Innis free pike, two five acre lots in the parcel extending to the township road on the south; the consideration was \$12,410.00, or about \$275 per acre. The second parcel consisting of twenty-three and three-fourths acres, joining the first parcel on the west and giving a railway frontage, was purchased from Mrs. Annie E. Dennison, for \$7,134.70, or \$300 per acre. The third, fourth and fifth parcels, consisting of five acres each and fronting the township road on the south, were purchased, the third from Mrs. Mary Innis, for \$2,500, or \$500 per acre; the fourth from William Murdock, for \$1,750, or \$350 per acre, and the fifth from Turpie & Jones, for \$3 000, or \$600 per acre. The sixth parcel consisting of five and fifty-five hundredth acres, was purchased from Mr. H. T. Chittenden, for \$5,550, or \$1,000 per acre. This purchase carried with it the agreement of Mr. Chittenden, to donate land and open and gravel Woodward Avenue, from its then terminus to the grounds. This made the grounds directly accessible from High street and the horse car line, and squared out the south front

of the grounds, with the exception of two half acre lots, containing small houses and barns. These were finally purchased as parcels seven and eight—seven from Joseph Monnett, for \$1,500, or at a rate of \$3,000 per acre, including buildings, and eight from Abram Dow, for \$1,200, or at a rate of \$2,400 per acre, with buildings. This gave the Board some ninety and a half acres of land, at a total cost of \$35,044.70, or an average cost of about \$388 per acre.

Early in 1884 the work of preparing the grounds was begun, first by a thorough system of underdraining and a general cleaning. Later on the services of a skilled landscape gardener were secured, and after the adoption of plans for laying out and beautifying the grounds, that work was begun and pressed forward as rapidly as possible, and a regular transformation scene has taken place.

On July 1st, 1885, the Board placed \$60,000 of its bonds, and after the adoption of carefully considered plans submitted by the architects appointed, a contract was entered into on the 4th of August following, with Mr. W. O. Rowe, in the sum of \$45,467.28 for the furnishing of material and construction of a power hall, cattle, sheep and swine buildings, horse stables and a grand stand. These buildings are now all under roof and the contract nearly completed. On November 22d, 1885, a contract was entered into with Mr. W. King, for furnishing material and constructing entrance ways according to plans, and for the construction of a picket fence around the entire grounds, (labor only). His proposition being \$1,582 for the entrance ways, and 6½ cents per lineal foot for the fence.

In the execution of this work, together with the landscaping, graveling, tree setting, etc., the Board has exhausted all its available funds, including the \$15,000 appropriated by the last Legislature, to be spent on the grounds. There is much, however, to show for this expenditure, and the Board feel that the General Assembly and the people of the State will be well pleased with the substantial character of the buildings contracted, and the beauty and convenience of the improvements generally.

It will yet be necessary to provide for the erection of a main building for the exhibition of farm products, fruits, flowers, manufactures and fine arts, and for this purpose the Board has asked the present Legislature to make an appropriation of \$50,000. This sum will erect a substantial and commodious building, and thus enable the Board to complete the grounds in time for the State Fair of the present year. I believe the Legislature, with your endorsement, will make this needed appropriation. If so, Ohio will be provided with facilities for the exhibition of agricultural and mechanical products, second to none in the United States. I hope the members of this Convention, or as many who can, will visit the grounds and examine for themselves the work they have entrusted to the State Board, and I should also be pleased if every member of the Legislature would see the work that has been done, and which, by law, becomes State property, for I feel sure in that case, the needed appropriation to complete would be cheerfully voted.

There is but one other matter to which I wish to draw your attention, and which may be thought worthy of consideration. Two years hence will dawn upon this now prosperous State, the centennial of the settlement of the Northwestern Territory, including that portion now known as the great State of Ohio. The wonderful progress that has been made since 1788 in transforming a wilderness into busy and densely populated cities, thrifty villages and broad acres of well cultivated fields, can hardly be realized except by tracing back our history as a State and noting the changes that each year have taken place. It seems to me right and proper that two years hence should be made a commemorative occasion, and a proper way would be by a grand exhibition represent-

ing the industries of the State, in which all the people could participate. Columbus would be the proper place for such an exhibition,—first, because it is the Capital of the State; and second, because it is readily accessible to every city, town and station within our borders, and is amply able to accommodate the thousands of our patriotic people who would hail with delight the opportunity to join in such a commendable testimony.

The State Fair Grounds could be made to do duty in this connection, if the authorities of the State should so decide. This suggestion may seem premature to some, but it should be remembered that the preparation for an exhibition and celebration of this character would require time, more than can be crowded into one year. I simply allude to this subject as one worthy of your consideration and the attention of our General Assembly.

Before closing, I desire to bear testimony to the faithful manner in which the members of the Board have represented you in the interests committed to their care. They have given much time and attention to your work and carefully considered every proposition presented. As the presiding officer of the Board, I have had the able assistance and co operation of each member, and also of the Secretaries and clerk, who have been pressed with business that has been carefully transacted.

Gentlemen, I thank you for your attention, and now await your pleasure in the further business of this Convention.

The Treasurer submitted the following report:

ANNUAL FINANCIAL STATEMENT.

Being for the year ending December 31st, 1885.

OHIO STATE BOARD OF AGRICULTURE,
COLUMBUS, January 12th, 1887.

The following statement, compiled from the Journal and Ledger record of itemized accounts, gives a complete summarized showing of the financial transactions of the Ohio State Board of Agriculture for the year 1885, ending December 31st, and is respectfully submitted, together with the books, vouchers, checks, etc., connected with the records from which the compilation is made.

Respectfully,

JOHN C. LEVERING, *Treasurer.*

RECEIPTS—FROM ALL SOURCES.

Balance from 1885.

In hands of Treasurer	\$844 61	
In State Appropriation	351 08	
		<hr/> \$1,195 69

From State Fair of 1885.

Sale of privileges.....	\$3,478 50	
Percentage on speed entries.....	3,000 00	
Percentage on class stock entries.....	1,707 45	
Sale of exhibitors' tickets.....	577 86	
“ special tickets	53 50	
“ grand stand tickets.....	1,409 50	
“ general admission tickets.....	19,029 00	
“ old lumber.....	500 00	
Sundry sources.....	40 10	
		<hr/> \$29,706 51

Miscellaneous.

From surplus fertilizer license fees of 1884.....	\$728 62	
From W. I. Chamberlain, Sec'y, drawn from State appropriation and deposited to credit of Treasurer, to replace amount advanced from funds in Treasurers' hands, for expense of farmers' institutes, prior to passage of appropriation bill.....	418 71	
From W. I. Chamberlain, account of salary.....	416 65	
" Jas. W. Fleming, " "	312 50	
" Frank Fleming, " "	125 00	
" Balance from amount drawn for expense of members to New Orleans Exposition.....	141 05	
From refund I. B. & W. R. R., account same.....	70 00	
" refund by L. B. Harris, account same.....	10 25	
" rents, etc., State Fair Ground.....	45 00	
" balance from amount drawn for expense of members attending Live Stock Convention at Chicago.....	40 00	
From other miscellaneous sources.....	122 00	
		\$2,429 78

Proceeds of Bonds.

Sale of bonds to the Deshler Bank, Nos. 1 to 120 inclusive, \$500 each.....	\$60,000 00	
Premium and accrued interest on same.....	575 00	
		\$60,575 00

State Appropriations.

For encouragement of agriculture.....	\$6,000 00	
" old surplus charged back to fund.....	2 95	
" contingent expenses.....	800 00	
" buildings and improvements.....	15,000 00	
		\$21,802 95
Showing total receipts from all sources		\$115,799 93

DISBURSEMENTS.

For old outstanding checks.	\$ 169 50	
" premiums.....	15,363 45	
" printing and advertising.....	3,058 93	
" labor and assistance.....	4,042 55	
" material and supplies.....	310 63	
" lands and improvements.....	75,240 27	
" forage and refreshments.....	1,424 81	
" expense of members.....	2,427 50	
" office expenses	624 60	
" postage and telegraph.....	773 09	
" express and freight.....	624 85	
" discount and interest	69 09	
" salary of Secretary.....	2,416 65	
" Assistant Secretary.....	1,812 50	
" regular clerk.....	725 00	
" refunded entrance fees.....	43 50	
" crops and institutes.....	1,364 44	
Total		\$110,491 36
From which deduct outstanding checks of present year.....		61 00
Amount actually disbursed.....		\$110,430 36

In the accounts, *Salaries*—Secretary, Assistant Secretary, Regular Clerk, and Crops and Institutes, is included the amounts advanced from funds in the Treasurer's hands prior to the passage of the appropriation bill for 1885, which amounts were drawn and re-deposited to Treasurers' credit at bank, as shown in receipts.

The salaries actually received by the officers named, were as follows: Secretary, \$2,000; Assistant Secretary, \$1,500, and regular Clerk, \$600, for the year; while the Crop and Institute account proper was \$945.73.

From the total receipts, from all sources, of.....	\$115,799 93
Deduct the total disbursements	110,430 36

And there is shown a balance on hand of.....	\$5,369 57
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This balance consists of the following:

In hands of Treasurer.....	\$2,041 85	
In the Sinking Fund.....	2,170 96	
In State Appropriation for encouragement of agriculture.....	995 89	
In State Appropriation for buildings and improvements.....	160 87	
	<hr/>	\$5,369 57

LIABILITIES.

For outstanding unpaid checks.....	\$297 95
“ outstanding bonds of the Board.....	60,000 00
“ amount due on existing contracts, about.....	16,000 00

Total	<hr/> \$76,297 95
Cost value of grounds and improvements, including that contracted and under way, about.....	\$120,102 70

REPORT OF AUDITING COMMITTEE.

To Ohio State Board of Agriculture:

GENTLEMEN: The undersigned committee, appointed to examine the annual accounts fully embraced in the Journal and Ledger records conducted by the Assistant Secretary, setting forth the full financial transactions of the Board, beg leave to report that we have carefully examined the records, compared all vouchers and checks, finding the receipts as set forth and all expenditures to be in accordance with properly approved vouchers, or by the direction of the Board.

We find that, owing to the largely increased business of the year, the conducting of the financial records has been an important part of the Department work, which, however, has been neatly and systematically performed.

The annual statement is a correct summary of the itemized accounts clearly defined in the records.

Respectfully,

L. B. HARRIS,
THOS. P. SHIELDS,
JOHN POW,
Auditing Committee.

The Committee on Order of Business reported, and the Convention proceeded according to the order named.

The Chair announced that the nomination of candidates for Members of the Board, was next in order.

LEO WELTZ.—I move the renomination of the present members, whose terms expire. I speak for them all. If there are any new candidates, let them be named. Motion seconded by W. N. Cowden.

A MEMBER.—Do you propose going into an election now?

MR. MURPHY.—I rise to a point of order. We have, as I understand it, adopted the rule, that the last action of this Convention, this evening, shall be the election of five members. You will have to suspend the rules first, before you can vote on a resolution of that kind. Am I right, Mr. President?

THE CHAIR.—You are.

A MEMBER.—I also rise to a point of order. I believe the law requires the election by ballot and not by motion. Ruled out of order.

F. B. MCNEAL.—Allow me also to second the nominations made by Mr. Weltz. Allow me to state that upon principle, and under all ordinary circum-

stances, I am an advocate of rotation in office; and would, after the usual custom of giving to a member of the Board of Agriculture a renomination for the second term, under ordinary circumstances oppose his being retained for a third term. I believe it is not for the best interests of our Board under ordinary circumstances. But there are circumstances now thrown around the Board that I believe makes it doubly important, not only to the harmony of the Board and the successful carrying out of the important matters, that they have now undertaking in the purchase and improvement and decoration at the new fair grounds, and I think not only inimical to the harmony of the Board, but it would be very vastly detrimental to the interests of agriculture in the State, to now make a change, and bring in members who are not acquainted with the circumstances which surround this project. I most heartily second the nomination of the old members, whether they have served one or two terms.

MR. MURPHY.—I rise to place in nomination Senator Sullivan, of Holmes County, whose initials I am not able to give.

L. N. BONHAM.—If nominations are now closed, I rise to suggest or call the attention of the Convention to a point in the order of business; and that is the joint meeting of this Convention and the Archaeological and Historical Society, which has been placed for three o'clock. I think it would be proper to state the object of that meeting. The Archaeological and Historical Society have in view a centennial celebration, to be held in 1888, and the object of this meeting is to discuss plans and devise ways and means therefor. Mr. Chairman, I move a recess until 2 o'clock, which will give the Committee on Resolutions time to report. Convention adjourned until 2 o'clock.

AFTERNOON SESSION.

The President called the Convention to order at 2:40 P. M.

MR. BONHAM.—Mr. Chairman, I will inquire if the Committee on Resolutions is ready to report.

THE CHAIR.—In a few minutes.

MR. BONHAM.—I would like to suggest that if they are not ready to report the entire line, that for the saving of time they report upon one subject, and then conclude the report afterwards.

The committee here signified their readiness to report, and the following resolutions were read by Chairman McNeal:

First resolution.—Resolved, That this Convention heartily approves the work of the State Board of Agriculture in purchasing and improving the New State Fair Grounds, with the purpose of affording to the farmers, mechanics, artisans, manufacturers and merchants of this great State, commodious and elegant grounds and buildings, for the annual exhibition of the products of our vast and varied industries. That we recommend and earnestly request our Senators and Representatives in the General Assembly, to promptly vote such appropriations as may be asked by the Board to complete the improvements projected.

Second resolution.—Resolved, That we view with alarm the fruits of the tariff reduction of 1883, as shown by the reduction of sheep in the State of Ohio by 290,000 head, as shown by the official records of the Auditor of State, for 1885, and the corresponding reduction in pounds of wool, calls for the serious and profound consideration of this industry. Such a large and important industry cannot be destroyed, without serious loss to the industrial interests of the State. We deem it the duty of every citizen of the State, to use his influence, to secure such legislation, that will give the needed relief. We also as a convention ask, that our Senators be instructed and our Representatives be requested to vote for a tariff rate equal to the tariff of 1867.

Third resolution, as amended.—*Resolved*, That we most earnestly request our General Assembly, to enact such laws as will most effectually suppress the sale of bogus butter and cheese, except upon their merits and by their true name. That all manufacturers of oleomargarine, butterine, or other adulterations of true butter, be required, under heavy penalties, to stamp plainly and conspicuously on all packages, the true name of their products, and that any retail dealer selling such manufactured product for real butter, shall be punished by fine or imprisonment, or both, and his business declared a nuisance and abated as such.

Resolved, That a Dairy Commissioner be appointed, with full power to enforce the law, and with a fair appropriation for the same.

Fourth resolution.—*Resolved*, That the General Assembly of Ohio be, and it is hereby urgently requested to grant full power to the State Live Stock Commission to condemn and destroy all animals and herds, wherever found, afflicted with contagious diseases, and for this purpose we urge the appropriation of not less than \$50,000, to be expended as may be needed, according to the judgment of the Live Stock Commission for the suppression of contagious diseases. And that it is the sense of this Convention that the general government should provide for the inspection of animals intended for export, so that American pork may go abroad with the brand of the Government Inspector upon it, showing that it is free from disease.

Fifth resolution.—*Resolved*, That in view of the immense loss to agriculture and horticulture and the animal industries of the State, from damage by noxious insects, we earnestly urge upon the General Assembly the employment of a State Entomologist.

The resolutions were then taken up, one by one, discussed, amended and adopted.

First resolution read by the Secretary. On motion, the resolution was adopted without discussion.

Second resolution read by the Secretary. On motion, the resolution was adopted without discussion.

Third resolution.

A MEMBER.—I move an amendment to the resolution. Instead of severe punishment, insert the words "punishment by fine or imprisonment, or both; and his business be declared a nuisance, and abated as such."

PETER MURPHY.—I second the amendment. Amendment adopted.

THE SECRETARY.—I would like to say a word. As a delegate from the State Board of Agriculture, I attended the meeting of the National Butter, Egg and Cheese Association, in Chicago, in November. It was the universal opinion of all the delegates there that any law passed would be inoperative, unless there was some person appointed as commissioner to enforce it. And for this reason. The fraud committed, and the damage or pecuniary loss to each individual is so small that the individual can not afford to prosecute it. Furthermore, the proof is very difficult. It requires either a chemical or microscopical examination to establish the proof; and it was the opinion of the delegates from all over the United States, that the law would be inoperative, unless there was a dairy commissioner, or some commissioner appointed, whose business it should be to enforce the law, and who should have the necessary funds and powers to enforce it. Furthermore, I have had occasion recently to examine the legislation on the continent of Europe, and especially in England, in regard to the adulterations of food. In 1860, the English Parliament passed a general law on the adulterations of food, but made it permissive and not mandatory. They did not require the appointment of commissioners to enforce it. That law remained a dead letter until 1872, when it was amended

and made mandatory. And the same I find to be true in regard to all the nations of Europe. Wherever the law was permissive and no one to enforce it, the damage to the individual was so small and the proof so difficult, that he did not afford to enforce it. The profits of the manufacturer are so great that he will persist in putting his goods on the market. In 1872, in England, the law became mandatory, and commissioners were appointed in regard to all adulterations of foods. Since that time the law has been truly efficient. I have noticed another thing, that, although all nations, Christian and civilized, have succeeded in putting down the counterfeiting of money, it was not until '72 that the Christian nations of Europe succeeded in putting down the adulteration of food. They have now virtually succeeded, so that now the United States are about the only Christian and civilized nation that pays no attention to adulterations. The history of the past should be a guide to us, and the uniform testimony and opinion of the delegates at the National Convention should guide this Convention. There should be some addition to this resolution looking to the appointment of a State officer, whose duty it should be to enforce the law. I am not a member of the Convention and cannot offer an amendment. I believe Mr. Talcott, who drew the original resolution, had that idea in it. I believe an amendment of that kind would pass.

MR. TALCOTT.—I did draw a resolution in compliance with the appointment of our State Board of Agriculture. I gave it into the hands of the chairman, and I don't know but he has it here. That, we intended would be added to this resolution. It was in substance that we appoint a dairy commissioner with ample power to enforce the law, and with a sufficient appropriation to enable him to do it. I would offer that as an amendment to the resolution.

MR. REICHENBACH.—I desire to offer an amendment to the resolution; that the Secretary of the State Board of Agriculture be authorized to enforce the law.

THE SECRETARY.—I wish my friend Reichenbach would withdraw that amendment. The Secretary of the Board has all he can do now, and his assistant too. It seems to me this would take the entire time of a separate person.

MR. REICHENBACH.—If agreeable to Mr. Talcott, I will withdraw.

A MEMBER.—I would inquire whether an amendment or any addition to that resolution has been offered.

A MEMBER.—I believe a bill has been introduced into the legislature for the appointment of a dairy commissioner, with a salary of \$2,000 a year, whose business it will be to look after this matter.

A MEMBER.—Members will find a copy of this bill on their desks.

A MEMBER.—We were well aware that such a bill had been introduced, and we feel that this Convention should give its support also, to let the legislature know that the farmers are in harmony with it. We feel that any law would be inoperative, unless a commissioner is appointed.

The question of agreeing to Mr. Talcott's amendment then came before the Convention. Amendment agreed to.

The question of agreeing to the resolution, as amended, then came before the Convention.

A MEMBER.—I would ask that the resolution be read, as amended.

The resolution, as amended, was then read and adopted.

The fourth resolution was then read.

MR. BONHAM.—I see that it is after the time that the order of business called for this joint meeting, the meeting of this Convention and the Archaeological and Historical Society. I move you, sir, that we suspend further busi-

ness until after the meeting of that joint Convention, and we will take this resolution up afterwards for discussion.

JUDGE JONES.—I suggest that this report be re-committed to the committee on resolutions.

DR. HAZZARD.—I move the re-committing of the resolution.

The motion being duly seconded, was then decided in the affirmative.

MR. BONHAM.—I move that this Convention take a recess until after the joint meeting of this association with that of the Archæological and Historical Society, and that they be invited to come on the floor with us. Motion agreed to.

The joint convention being called to order by the President, Mr. Bonham moved that Gen. Brinkerhoff be made chairman. Motion decided in the affirmative. On taking the chair, Gen. Brinkerhoff spoke as follows:

GENTLEMEN OF THE CONVENTION: I am called to a position that I am not prepared to state, as chairman, really what the purpose of this meeting is. I am a member of the Archæological and Historical Association, and deeply interested in the work. I have been invited here as one of the officers. The President is not present. Senator Thurman is President. I am simply a subordinate officer. But I understand there is a gentleman to be here, or was to be here, who will state the object of this meeting. Mr. Graham, I see, has just come in, and if he will state the object of the meeting, I may have something to say further. I understand it is simply an arrangement by which it is intended to ask the co operation of the State Board of Agriculture in celebrating the centennial of the State.

MR. BONHAM.—I will call upon Mr. Chittenden to present this matter to the Convention.

MR. CHITTENDEN. GENTLEMEN OF THE CONVENTION:—I hold in my hand a copy of the resolutions prepared, to be submitted to you for approval or rejection, by the joint committee, made up of a committee consisting of the Ohio Archæological and Historical Society, and a committee by the Ohio State Board of Agriculture. This committee has held several sessions, the first of which was held some time in the month of November last. After due consideration, the committee offer, as I say, for your approval or rejection, these resolutions. Resolutions read by Mr. Chittenden.

REPORT OF COMMITTEE TO CONSIDER THE QUESTION OF AN OHIO CENTENNIAL EXPOSITION, IN THE AUTUMN OF 1888.

WHEREAS, The year 1888 marks the end of the first century since the first permanent settlement was made in the State of Ohio; and,

WHEREAS, The century has been one of greatest progress in the history of civilization, a progress in which Ohio has taken a leading part; and

WHEREAS, It is not only practicable, but desirable, that the people of Ohio should commemorate in some appropriate manner the close of the first century of our history, and the beginning of the second; therefore,

Resolved, 1st, That there be held in the autumn of the year 1888, an Exposition commemorative of the establishment of Ohio, and of its development during the first one hundred years of its history.

Resolved, 2d, That the Exposition be held in connection with the State Fair of 1888, on the State Fair Grounds, near the city of Columbus, and continue not less than four weeks.

Resolved, 3d, That this Exposition shall embrace such features, as will exhibit properly the progress of Ohio in Education, Religion, Literature, Arts and Sciences, Manufacture, Agriculture, Mining, Commerce, and all intellectual, political and industrial affairs.

Resolved, 4th, That while Ohio is the first State formed within the old northwest territory, and therefore has derived the greatest benefit from the ordinance

of 1787, yet we should encourage in this Exposition the co-operation of those other States, viz: Indiana, Illinois, Michigan and Wisconsin, which were formed originally within and from this territory, under the same "Compact of Freedom."

Resolved, 5th, That to provide properly for the management of the proposed Exposition, there shall be constituted a Board of Exposition Commissioners, consisting of nine (9) members, five (5) of whom shall be appointed by the Ohio State Board of Agriculture, and three (3) by the Ohio State Archaeological and Historical Society, of this Board the Governor of Ohio shall be ex-officio, a member and its presiding officer, with a voice in all its proceedings.

The Board of Exposition Commissioners, shall have exclusive direction and management of the Exposition.

Resolved, 6th, That for the purpose of holding such an Exposition as is contemplated in the foregoing resolutions, the General Assembly of Ohio be requested to appropriate the sum of \$150,000.00, for the erection of suitable buildings and for defraying the necessary expenses incidental thereto. Such buildings and permanent improvements necessarily made, to be and remain the property of the State of Ohio.

H. T. CHITTENDEN,
W. I. FOSTER,
L. N. BONHAM,
W. Y. MILES,
E. O. RANDALL,
JAS. W. FLEMING,

Committee.

A. A. GRAHAM, *Secretary.*

After reading the resolutions, Mr. Chittenden said:

As you had the courtesy, gentlemen, to adjourn, or take a recess, for the purpose of entertaining these resolutions, I shall not waste any of your valuable time in discussing what is here proposed. It seems to me that the history of this very affair, such as it has had within the last ten months, establishes the fact that the spirit of every man in Ohio rises up to welcome such a movement as this. Ever since the meeting of the Archaeological Society in February last, at which time this matter was discussed by such men as Senator Thurman, Gen. Brinkerhoff, and others, with very great approval, up to the present time, I have caused inquiry to be made wherever I could reach the prominent and influential men of the State, and I have yet to learn of one who is not heartily in accord with this movement. It meets with approval by the legislature, by judges, and by those who have retired from active life. Those whom you represent, I understand, are uniformly in favor of the resolution; you who represent the power and dignity of the State of Ohio. We are called upon by every consideration to give a fitting celebration to the 100th birthday of our beloved State. It is a remarkable fact, gentlemen, worthy of observation by anybody, that the 19th century has shown more progress than all the eighteen which have preceded it. It is worthy of note, and it seems hardly recognizable as a fact, and yet it is a fact, that the sickle which was used at the time of Christ, was almost the only instrument used in the cutting of grain 100 years ago. Water was elevated and distributed by almost the same process used in the time of Pharaoh. The gathering together of the grass was done by hand. The sowing of the seed was done by broad-casting. Arkwright had not invented the spinning jenny. Nothing in the way of illumination by electric light or gas had yet been discovered. The very easiest carriages were hung on bands to ease the jolting, and twelve or fifteen miles an hour was the highest speed royalty could attain. Now, I don't need to spend time in speaking of what we have reached. Today all the fairy tales of our youth have been realized.

Men speak with each other at a distance of 150 miles, as Mr. Miles told me a day or two ago he did with a friend in Cincinnati. We look on the faces of our friends in the photograph, as vividly as if we saw them face to face. But these things speak for themselves; therefore, I will not take your time further, in speaking of celebrating the progress of the material world, and especially of our beloved Ohio.

MR. BONHAM. *Mr. President and Gentlemen:*—You take me on a subject that I am not posted upon. I think the subject has been very handsomely and ably presented by Mr. Chittenden. But as a member of that committee, I would like to say a word in the endorsement of the scheme. There is to my mind only one drawback as I approach the subject, and that is the enormous amount of money required to make a creditable exposition for such an occasion. We know something of the difficulties that will meet us in the way. We know that there will be special buildings to be erected. We know that the State Board of Agriculture has not the means to erect them. And our only hope is to call upon the citizens of the State to take a pride in this measure, and go forward and give us the means to erect such buildings. Another thing in favor of it, to our mind, is, that the erection of buildings for this exhibition would not be like the erection of buildings in some out of the way place, or in some city where the buildings can never be used again; but these buildings can be erected in such a way as to meet the purpose of this centennial exposition, and then become the property of the State on the Ohio State Fair Grounds, and of such a character as will be a permanent good to the State of Ohio. So it is not only an investment for the celebration of this event, but a permanent investment for the good of agriculture and the industrial arts. Now I think, when we look upon the subject in this light, the great amount of money asked for our enterprise should not appal us. I realize that the farmers throughout the State, to day, feel poorer than they ever did before, I think that is true. Hence we feel that asking such a thing as this at this time is a delicate matter. But when we realize that it is only once in the history of this generation that we shall be called upon to celebrate such an event, and that this is not a dead loss, but an investment for the permanent good of the State, we feel courage in asking it. I believe that the State Board will respond heartily, and use all diligence to the extent of its means in forwarding this enterprise. But that would be useless without the support of every county in the State. We need the influence of all the counties upon the legislature to produce any satisfactory results, and I hope these resolutions will be adopted; and that we will use our utmost means to have a celebration that will be a credit to the State of Ohio, and worthy of the day.

MR. GRAHAM. *Mr. Chairman:*—As Secretary of the Archæological Association, I wish to say that I have received during the summer a large number of letters from all parts of Ohio on this subject. The project of holding the exposition by itself could hardly be entertained. To hold it in connection with the State Fair, when the buildings are completed would facilitate the business, and the extra expense would not be large, and could be made in the way of fees, so that we need not in the end lose anything by it. Many of the prominent educators of the State have asked for a creditable school exhibit. The manufacturers have also asked it. I have been asked to go to a number of towns in Ohio and meet the citizens upon this point. I have letters now asking me to go to Wooster and other towns. I can say, as far as the historical part of that exposition is concerned, it would be exceedingly rich. There is not a State in the Union that boasts as much history of all kinds as Ohio, and there is not a State in the union that has furnished as many leading men as Ohio. It has taken the palm away from every other State. This is the case

in all departments of industry. We represent very great manufacturing interests. If this enterprise is carried through, we can get the co-operation of every manufacturer in the State. I know I can enlist the aid of every county, and I have been told if I would come to such counties as Washington and Licking, and work up a little interest, I can secure a cast of the old earthworks there, and after the exposition they can be placed in a museum.

MR. BROWN.—Like the gentleman who read the resolutions, I don't feel like taking the time of the assembly, in speaking in the direction of convincing any one of what I believe to be a necessity. We certainly should have an exposition in 1888. Ohio never had an exhibition that partook of a national character. With such an exposition, we certainly would enlist the sympathy of all the other States, that were carved out of the original north-west territory. Indiana, Illinois, Wisconsin and Michigan, would join us in a certain way, to add to the historic value of such an exposition. An exposition, however, costs money. I think that the gentlemen in preparing the resolutions have been very modest in the sum they have named. \$150,000 is not an extravagant sum. It would seem to me that a half a million dollars would not be a sum too large, judging from the expense of the other great expositions in this country. But if they are prepared to enter on the work with \$150,000, I think we can safely say to the people that this is a very modest sum. Such an exposition would require a competent head, a competent director-general; and I was pleased to notice that in the provisions for the management of the exposition, the board of exposition commissioners has not been made too large. Those of you who have read of the Vienna Exposition, our own at Philadelphia, and the Exposition at New Orleans, will know that it is best to concentrate a great deal of power in one man. We shall be fortunate, if we shall obtain an efficient head, who is a specialist in this direction; and while we speak of Ohio as producing great men, Ohio has produced what is certainly one of the greatest exposition experts in the world, I refer to Mr. Goshorn, of Cincinnati. There will be need of assistants, to co operate with him; and with the experience of those who have conducted the Cincinnati Exposition and the State Fairs of Ohio, I think there will be no trouble in securing assistant commissioners. In speaking of the influence of expositions on education, I may say that educators believe that we owe a great deal of the progress of education to the Exposition at Philadelphia. And it is the opinion of those who attended the New Orleans Exposition, and studied the exhibit made by the schools there, that that Exposition, if it had done nothing else, by the impulse which it gave to the progress of education in the South, has been worth all it cost the country. There is but little time to prepare for this Exposition. If we are to have an Exposition in 1888, it is time we get to work. I think our friends in New Orleans postponed the preparation for their Exposition to too late a date. It is time we had the appropriation and get to business pretty soon. I hope the resolutions will carry.

SENATOR SULLIVAN.—I certainly did not expect to say anything on this question. And while responding to the call of my name, I think that I cannot add anything to what has already been so well said by the gentlemen who have already spoken upon the subject. I will say, however, that I heartily approve of the project. I think it is one that the State of Ohio could well afford to engage in. The third State in the Union in point of population, and indeed we are not willing to take a second place to any State in point of patriotism and State pride, I think we can very well afford to spend this moderate sum in the celebration of the centennial of the great State of Ohio. I will say further, in talking with those in my own county, my district, they are ready to give the project their hearty support. And the feeling which prevails there, I take it, permeates every part of the State. The State that was able, during the dark

days of the rebellion, to furnish 310,000 men, and more prominent Generals and greater men than any other State in the Union, will not at this time be found wanting when called upon to celebrate its hundredth anniversary. Now my friends I will not detain you, as I feel that I have nothing to say of general interest. But I will say this; whatever of influence I have shall be given to the advancement of this project and its successful consummation.

MR. HURST.—*Mr. President:* I can only say that I am heartily in sympathy with this proposed centennial. I feel a pride in the State of Ohio. And while I think the average Ohio man has been neglected in the past, I think he might properly come to the front now. This is a great State. Centrally located, vast in its resources, wonderful in its production of men, as well as products direct and indirect of the soil; wonderful in its skill, wonderful in its enterprises, this great central State of Ohio might have an exposition here that would be a credit to ourselves not only, but to the whole nation. Centrally located, we could draw from all sections of the country, large numbers to witness our growth and the wonderful development of our resources in a century; the labor, the skill, the art, the science, the culture, the growth of one State in a century. It would in this be a wonder. It would in this be a great education to the people in this country. And as Mr. Bonham has said, it seems now most prudent at the time that we are putting up buildings for our State Fairs, owned by the State, the property of the people, for the exposition of all the industries of the State, that just at this time it is most prudent that these buildings be made large enough, commodious enough, elegant enough, to hold this Exposition; so that not only now, but to all the future, this would be a pride to the State, where each year the work of hands, the skill and industry and products of our soil and ingenuity would be exhibited to the world. It would open up a new channel of education to our people. Heretofore we have had no such facilities as these. The miserable grounds, and more miserable buildings, in which we have held our exhibitions, were unworthy of the State and people. So it seems most prudent that now we should have this centennial idea planned with our contemplated work. I most heartily approve of this measure. I believe it would be a pride to the State, a great benefit to our State, and to all our industries. It is not class legislation; not for the farmers alone, though that is the great industry of the State; but it reaches everybody, the manufacturer, the artisan, all. It appeals for our hearty support.

CHAIRMAN BRINKERHOFF.—If it is your pleasure, I would like to say something on this subject myself. I have been interested for quite a number of years in the history of the archæology of the State of Ohio. It was my honor to be associated with the origin of the Archæological Association of this State some years ago. And then again with the organization of the Archæological and Historical Association. I was also associated with the exhibit made of the Archæology of Ohio, in the Centennial Exposition, at Philadelphia, in 1876, which was the outgrowth of the Archæological Association formed prior to that time. So that in correspondence, by intercourse with men from all portions of the State on this subject, I have become quite well acquainted with the wealth of Ohio in historical and archæological remains. Now with the little appropriation which we had from the Ohio Legislature in 1876, which was but \$2,500, we made an exhibit of Ohio archæology in the Centennial, which was a marvel in its richness. There was but one exhibit in that Centennial, out of many that were presented of archæological remains, and that one the Smithsonian exhibit, that was anywhere equal to the one that we presented. And in my judgment, and in the judgment of archæologists, not only from this country but also from Europe, the exhibit made by Ohio in 1876, at that Centennial, as a typical exhibit of the pre-historic people of this continent, was not surpassed even by

the Smithsonian exhibit. And I know as a fact, because it is a fact, and recognized all over the world, that in the pre-historic remains of that ancient people that resided in this country, Ohio is the richest of any State in the Union.

Now these ancient people were a wise people. That ancient people recognized a good country just as well as we recognize a good country. And there were, as we know now, by the state of the archaeological remains of this State—because we know now of at least 10,000 of the mound remains of this ancient people within the boundary of the United States,—we know, I say, that Ohio, in the southern parts of the State, was as populous in some pre-historic times, under an organized government, as it is now. Now there are scattered all over this State remains of this pre-historic people. There is not a county in this State in which there are not collections of the remains of this ancient people. If the State of Ohio, as a State, will only provide the necessary custodial care of the collections that can be contributed to it, and which would be contributed to it, I will guarantee the Board that at that centennial we will have for the State of Ohio, in money value, contributed to it, to remain here for all time, pre historic remains that will be worth in money a hundred per cent. more than the appropriation that is asked for to-day, and no question about it. I know in my own county, which was not so populous as these southern counties in the ancient times, I know of three collections, yes, four collections in my own county, which can all ultimately be contributed to the State of Ohio, if the State will take the custodial care of them. One of them I had to the Centennial in 1876; that magnificent collection, which belongs to a physician in our county, the money value of which, in the market to-day, is not less than \$10,000. I think that collection, at the death of this gentleman, who is now seventy-five years old, can be secured by the State, if Ohio will pledge herself to take care of it. I was told in the last week, by a gentleman in my own city, a gentleman who has a very fine archaeological and geological cabinet, that if the State would pledge herself to take care of his exhibit, he would gladly contribute it. I know, too, of a collection in Cincinnati that has never come to light, belonging to a gentleman who has devoted his life to the collection of the pre historic remains of this country, and which I have been told by Dr. Hill, of Cincinnati, who has himself a very large collection, which this room would hardly contain, that the market value of that collection is many thousands of dollars. It is a shame to us as a State, and yet it is true, that there are better collections of the pre-historic remains of the State of Ohio in Berlin, London and Paris, to-day, than in Ohio. We are the spoil of all nations. We have permitted these things to pass away from us into other lands. But, fortunately, we have had collectors who have taken a pride in these things. In every county they have been gathered. Now this little association of ours, which has been organized for only ten months, has an exhibit worth several thousand dollars at the University. But if it could be known that Ohio would take charge of the remains, and the thousand things which enter into the history of the State, they would be tendered to the State by the people. Why, we are almost a century old. Look at the other States. There are gentlemen in this room, who, like myself, have visited that wonderful collection at Madison, Wisconsin, a young State, which took away from us the librarian who has charge of them, Mr. Butterfield. They have erected a fire-proof building, and have gathered historic and pre-historic remains of that State and have a collection that is worth many thousands of dollars, and which is the pride of the State. Every one in the State of Wisconsin, of intelligence, will tell you that the collection is the pride and glory of the State. So in Arkansas and other States of the West.

And shall we of the State of Ohio, the first born of the ordinance of 1787,

which dedicated these States to freedom, shall we, with our wealth, and with our prestige, permit all these things to go away?

Go to Boston. They have despoiled Ohio, in every county of it. Mr. Putnam, the Secretary, has his agents in different portions of the State to obtain these remains and carry them away. The Smithsonian Institute is doing this, and has been for years. Shall we permit this thing to go on, when all that is necessary is to furnish the necessary custodial care, and have somebody too look after them, and suitable buildings? If these are furnished, we can have at that centennial as noble a collection as was ever made, and which will surpass, I have no doubt, in its historic value, the Smithsonian collection. Now we have a gentleman here, and I know him well, who seems to have been born for that kind of work. Let him go into the various counties, and communicate with leading men who have these collections. These men who have spent their lives in gathering these things together, would be glad to give them to the State of Ohio, as their collection, to which their name is to be attached through the years that are to come. Ohio, in the expenditure of this money, is not going to spend money to be lost. There is nothing that will yield so enormous a percentage of real value as shall be gathered in the buildings that shall be constructed permanently for the purposes of preserving these remains. I hope, gentlemen, that the impulse that you can give to this thing to-day, will go on. I know the people are taking an interest in it all over the State. There is a gentleman, whose name has not been mentioned here to-day, who is superintendent of the schools in Cincinnati, who has printed, at his own expense, a brief history of Ohio, which will be sent out to the teachers of this State, and go into all the Schools of the State, to awaken the children to the study, and to take an interest in its noble record and magnificent history. Our children should know something of our State in the past. I was not born in the State of Ohio, but have been here for many years, and have been in every State east of the Mississippi, and every State but one west, and the noblest one in the galaxy of all the States, is the State of Ohio. I wanted to say this much for the association, because I am deeply interested; and if there is nothing further to be said, I will put the motion.

The motion for the adoption of the resolutions was then decided affirmatively. At this point an announcement was made that the members were invited to attend an illustrated lecture to be given in the Hall of the House of Representatives.

MR. BONHAM.—I move that the joint convention now dissolve, and that the Agricultural Convention resume immediately thereafter. Motion decided in the affirmative.

The Chair immediately called the Convention to order, when Mr. Hurst presented the following:

At the annual meeting of the Ohio State Horticultural Society, held in Columbus, December 2d, 3d and 4th, 1885, a committee of five, consisting of President Ohmer, Secretary Campbell and Messrs. Townsend, Weltz and Hurst, were appointed as a standing committee to confer with the State Board of Agriculture, to counsel with and aid said State Board in the work of improving and ornamenting the new State Fair Grounds, and especially as to the erection of Horticultural Hall for the exhibitions of fruits and flowers. We have never had a fit place in which to show the fruits of our labors and we are most anxious for the success of the improvement so admirably planned by the State Board. As a committee thereof, representing the horticulturist of the State, we earnestly appeal to the farmers and to the representatives of other

great industries of Ohio to support and encourage our State Board of Agriculture, and through our representatives in the General Assembly to provide the necessary means for completing the improvements so well begun.

By the Committee,

N. OHMER,
S. W. CAMPBELL,
DR. N. S. TOWNSEND,
LEO WELTZ,
S. H. HURST.

The fourth resolution having been recommitted to the Committee on Resolutions, was reported back and read by Mr. McNeal.

DR. SHIELDS.—I am sorry that Judge Jones is not present, for he is accustomed to speaking and can make himself much better understood than I can, but he is out at this time.

The Live Stock Commission requested the Governor to recommend to the legislature an appropriation of \$5,000 to be used in connection with the subject of hog cholera. They requested further, an appropriation of \$15,000, which is to cover the ordinary workings of all the expenditures of the Board in connection with its usual working, and appointment of a veterinarian. They further recommend that an appropriation of \$10,000 should be made to use in case there should be an outbreak of pleuro pneumonia. Now, while these sums all added together seem to aggregate quite an amount, yet it is not equal to what other States are doing. The State of Illinois, whose interests are no greater, and not so great as those of Ohio, appropriates \$62,500 to carry out this very work. The States of Iowa, Nebraska, Kansas and Missouri, and nearly all that I have had occasion or opportunity to learn what they have done, have appropriated \$20,000, \$30,000 and \$40,000. And Ohio has interests much greater than these States. Now I will state that I got it from good authority this very day, that the herd of Lake and Frisbe, of Kentucky, that was so afflicted with pleuro-pneumonia a few months ago, has been sold to speculators, and that a number of them have been brought into Cincinnati clandestinely, and sold there, and the Live Stock Commission have not power sufficient to act in the matter.

The act, as it now exists in Ohio, really amounts to very little. When the Commission went to Gov. Hoadly, and asked him to make a proclamation against the introduction of diseased cattle, the Governor did not think he had the power to do so, but issued a proclamation requesting the good people to abide by the rules and regulations adopted by the Live Stock Commission. There is too much at stake, gentlemen, for us to permit this matter to rest. We are sleeping over a fire. It may break out at any moment in this matter of pleuro pneumonia. The loss in Great Britain alone in the last ten years has averaged ten millions of dollars a year. What are the interests of Great Britain compared with those of the United States.

In the matter of hog cholera, I saw a statement of the statistics recently gathered together in Illinois, and it is estimated that one-third of the value of the hogs in that State have been lost by hog cholera.

I issued a circular a short time ago, relative to the existence of hog cholera, sending them to every county in the State; some have reported and some have not. Some report no hog cholera; others that they are losing from 20 to 30 or 33½ per cent. In connection with this subject, I would say to the delegates and parties to whom I sent these circulars, I hope they will be particular and report if there is any hog cholera there. We want to study out the disease. And I want them, if they have not the information themselves, to call to their aid some person who has had some experience in this matter, and report to us.

I don't think it is necessary to advocate and argue as to the importance of this matter being attended to by the legislature, and that promptly.

Now the Live Stock Commission proposes to immediately investigate this matter about the introduction of these cattle from Kentucky into Cincinnati. We propose to do that just as soon as we are released here. But we feel that we have not power enough, and we hope that the influence of the representatives and farmers here assembled will go up to the legislature, and they will be induced to enlarge our powers, and furnish us with the means to make it effective.

A MEMBER.—From the information the gentleman has given us, I am satisfied that the appropriation for stamping out the hog cholera should be doubled.

MR. SHIELDS.—When we went to the legislature last year and asked for ten thousand dollars, we got one.

MR. BONHAM.—Ask, and ye shall receive.

MR. ELY.—*Mr. President:* I have been, within the last six months, a sufferer from this disease of hog cholera, having, myself, lost more than \$200 worth on my farm, which is a small one. My neighbors have also suffered. I believe, as does the member from Williams county, that the appropriation of \$5,000 asked for is entirely too small. I move we ask the legislature to appropriate double that amount for that particular purpose, making \$10,000.

MR. BONHAM.—I would like to hear that part of the resolution read where it asks for \$5,000 in connection with hog cholera. I do not understand the resolution to read that that amount should be expended in an attempt to exterminate the disease. It reads something like this: For the investigation of the subject of hog cholera. Is that the point?

MR. SHIELDS.—The intention is that the money is to be used according to the discretion of the committee. There is nothing in the resolution about it.

MR. BONHAM.—Then you should have placed \$10,000 in the hands of this committee, for the extirpation of hog cholera. If I may be allowed to say a word or two, I would like to urge that every farmer in this State take an interest in this subject of protecting our hogs and cattle from disease. Every car load of cattle that comes from Europe to the west, comes through Ohio. Every car load of cows and calves that comes from the east to the west, passes through our borders. We know enough of the history of the insidiousness of pleuro pneumonia in Australia and Great Britain, to know that the transportation of diseased cattle through our States renders our herds doubly dangerous of disease. It is so insidious a disease, that when it finds a lodgment in a neighborhood, there is no getting rid of it, but by slaughtering all the diseased animals and those brought in contact with them. Hence I think that the farmers of Ohio have been sleeping over a volcano for years, and it is only a wonder that it has not broken out sooner. Fortunately for us, transportation has been from the west to the east, until the speculation in dairy cattle commenced, and then the transportation started west. Now it is a part of business economy, and we can show that clearly to any man who will give ten minutes attention to it, for the legislature to spend a few dollars and save a few millions. Take the history of pleuro-pneumonia in Missouri. In Missouri we had a man that opposed us in our attempts at the improvement of the Bureau of Animal Industry at Washington. It was but a few months until it broke out in Fulton county, Missouri. Missouri lost over ten million dollars worth of cattle in one year, to say nothing about the trade she lost. Whereas, if Missouri, Kentucky, Texas, and Tennessee, had stood by the efforts of the west to get legislation, we would have had \$100,000 in the hands of the Commissioner of Agriculture, to be expended for the suppression and extirpation of disease. The Commissioner said that \$20,000 spent in Missouri at the outbreak in

Fulton county, would have made the State as many millions; and he said right. Now we are upon the borders of Kentucky, a State that has no legislation whatever upon this subject, with her great cattle interests, particularly fine cattle, she is a particularly dangerous neighbor, with no restraint except popular sentiment. At Cynthiana, Kentucky, is that Frisbie and Lake herd. They are a pair of speculators whose object is to disseminate the herd. They have been restrained by the general government and popular sentiment; but we hear to-day the terrible and dangerous news, that they have smuggled, you may say, their cattle into our State to be sold. Now, the Lord only knows where these cattle will go to. But we do know that wherever these cattle go, we have a new centre for the disease. Now, we cannot be too active or urgent in presenting this to our Legislature. We cannot enlist the interest in the hog that we can in the family cow; but we can show in dollars and cents, that every farmer in the State of Ohio, is interested in this question of hog cholera. It requires but little observation for us to notice that along the Miami Valley, where they fed for the great Cincinnati market, where the farmers fed great droves of hogs—look at the history of Hamilton county, where the farmer that had not 500 or 1,000 hogs, was a poor man; but now there are not hogs enough raised for the meat of the family. Why? Because it has become such a dangerous business that they cannot afford to take the risk. The result is, the corn is sold to the distiller, or is shipped off the farm. It is not many years since, in this Convention, a member said that if the farmers of Southern Ohio would take care of their hogs, they need not have it. I think he will to-day, if he is present, tell you, he don't know how to control hog cholera. Nor is there any man who knows how to control it. We may as well sing psalms to a dead horse, as to preach about the matter. We know it is so. We have tried the closest rules for the protection of the herds, and yet they are swept like the besom of destruction. You may have an untidy neighbor, a neighbor, who lets his hogs roam at large, and become infected. You may have a careless neighbor, who wishes to make a little money, and goes to Cincinnati to get a car load of hogs. You are helpless. He brings the means of danger not to you only, but to the whole neighborhood. Every neighborhood in Southern Ohio can testify to similar experiences. Now what we want is, that when such things occur, and the disease breaks out, this Commission shall have power to quarantine them; and if the farmer has not enterprise and judgment enough to control it himself, they take control of it, and prevent him from scattering the disease; in other words, to destroy his herd then and there. I would never be satisfied with anything short of that. Now then comes the point. Will \$5,000 in your neighborhood, brother Ely, wipe out the disease there? No. But I believe it can be destroyed. I know when it struck me seven years ago, no man got the disease from me. But I got it from a neighbor two farms from me. I determined, as soon as a hog became diseased, he should die and be buried five feet under the ground. I destroyed animals that I would not have taken \$100 or \$150 for. And I have kept it from spreading. And it can be done everywhere.

MR. SHIELDS.—I don't know but it would be well for Brother Bonham, or some one who has power, to offer an amendment to appropriate a certain amount to be placed in the hands of the Commissioners, not to specify what is to go for pleuro pneumonia, or what for hog cholera. There may be pleuro-pneumonia, and no hog cholera; and there may be hog cholera, and no pleuro-pneumonia.

MR. BONHAM.—I move that they place \$25,000 in the hands of this Commission, to be expended in emergencies, for the destruction of herds contaminated with contagious disease.

The amendment of Mr. Bonham was then adopted, and the resolution, as amended, was also adopted.

MR. BONHAM.—For one, I would like to hear Mr. Weltz, who has been abroad, and noticed something of the handling of stock, and the treatment of disease.

Mr. Weltz, then read from memoranda made, his observation with respect to American meat, while on a recent tour through Europe, giving the reasons assigned by the German Government, for excluding American pork from their markets, among which were that the foreign consuls in this country were constantly reporting to their home governments, that diseased and badly slaughtered meat was being exported from this country. He, for this reason, advocated the appointment by the State, of an inspector to examine meats and collect statistics, and thus assist in restoring confidence abroad.

In concluding he offered the following:

Resolved, That the General Assembly of Ohio be requested to enact a law creating the office of State Meat Inspector, the duties of the office to be the inspection of meats slaughtered in the State, and the collection of such statistics as may give full information concerning the meat products.

MR. BONHAM.—I hope the resolution will not be adopted. There is a movement on the part of those interested in the transportation of pork, they are making an effort to get the general government to inspect all pork that is to be exported, on the principle that pork is inspected in Europe. The packer is to pay for the inspection. That will cover all the points designed in Mr. Weltz's resolution, as far as inspecting the character of pork abroad is concerned. I am glad to hear the defense given by our friend of Bismarck. Still, when we have shown in America, by inspection again and again, at Baltimore, Washington, Philadelphia, Chicago and Cincinnati, that not two per cent. of the hogs that are killed in America are affected with trichinæ. And when we have the record of history in our navy, that sailors have lived on this pork for years and never had a case of trichinosis known in the navy, it is perfectly absurd for Bismarck to tell us it is unsafe for it to be imported into Germany. On the other hand, the German pork, on their own admissions, show that in some cases it has run as high as seven per cent. affected with trichinæ. And only last year, at two German villages, trichinæ was an epidemic. At one time there were eighty persons down with trichinæ. That was after the American pork was excluded. And for Bismarck and the German Government to put up such a pretext, that because hogs were smothered in the cars, they were diseased; as if trichinæ had anything to do with smothering hogs in cars. It is too thin. It is only a pretext. It is a pretext of Bismarck and the German Government to offset our high tariff. It is a method of laying an embargo upon our pork. If it were honest and well founded, they have a right to protect themselves. But they have no right to damage our character by these false statements. I cannot support the resolutions. First, because there is no need in Ohio for the expense of an inspector of pork, when we have no trichinæ. Second, there is no need of any man being injured by eating pork, if he will only cook his meat. It is the abominable German practice of eating raw pork; and as soon as they will become more civilized, and cook their pork, then they need not slander their neighbors for eating bad pork.

MR. WELTZ.—I like the sense of the remarks of our friend Bonham very much indeed, and I spoke in defense of American pork just about as he has spoken, but it was a wasted effort.

The question then being on the adoption of the resolution, it was lost.

By the Chair.—Are their any statements to be made concerning the new fair grounds, their needs, etc.

MR. CHAMBERLAIN.—The first resolution was passed, commending the Board for the purchase of the new fair grounds, and urging the legislature to pass the necessary appropriation, or the appropriation asked for by the Board. Now it would seem as if the Convention had already made up its mind, and didn't desire any further information. It had been the intention of the Board, had the weather been suitable, that we would run a little train up and let the Convention see the work on the new fair grounds, as was done when the State Horticultural Society was here. I think I may safely say that the gentlemen connected with that Society, as shown by their report, read here a few moments ago, were pleased.

The President's address, which was listened to better, perhaps, than any preceding President's address, especially the latter portion of it, so fully set this forth, that I don't think there is any further need for information. But I wish, on behalf of the Board, that those who have any doubts of the wise expenditure of the money, would visit the grounds some time when the snow is off, so that you may see the landscape, bridges, the grand stand, horse stables, and buildings for other animals, etc.

Now we need money for one large building for the finer products, and that is what the legislature is asked to make an appropriation for. The figures have already been given. All of the money appropriated, all the money the Board had on hand, all the money raised by the floating of bonds, has been expended, or contracted for. And now the time comes when we must float more bonds, or have an appropriation by the legislature, or both; so that the next fair may be held there, and be a credit to the State. I believe I have never made any remarks uncomplimentary to the old fair grounds. They were beautiful. The trouble was that the State of Ohio didn't own any part or parcel of these grounds, and there seemed to be no means by which it could become owner. Therefore, there seemed to be a necessity for purchasing new grounds, the best that could be had. And so far as the buildings are concerned, those already put up on the new grounds, all will admit, are a credit to the State. And if the work can be carried on by the legislature and the floating of further bonds, I believe the legislature next year, if they have visited the fair, will be convinced that the work has been wise. If there are any questions any one wishes to ask of the Board, Mr. Bonham, Mr. Hurst, and others could answer them to the satisfaction of all. The weather is not fit to visit the grounds, and you would not enjoy the trip. I will not detain you by any further remarks.

A MEMBER.—If this appropriation is made by the legislature for holding the Centennial, and the buildings are then put up, would there then be a necessity for the buildings spoken of now? Would they not be included within the \$150,000? If that should be done, couldn't the Board worry through another year.

MR. BONHAM.—If the \$150,000 appropriation should be made, it is not expected that it will be available for the erection of buildings within the year. And it would not be contemplated to prepare such buildings before 1888. Of course we would labor under great inconvenience until that time. As a matter of economy it would be very desirable. But you will see that the Fine Art Hall and Horticultural Hall are not provided for. We have all the buildings necessary for stock. The horses, cattle and swine will be provided for, and the Grand Stand and Machinery Hall, but we have no buildings for fine arts, horticulture, etc. Hence we need immediate help.

MR. CHAMBERLAIN.—I may be allowed to suggest, that if the building proposed by the Board of Agriculture to be erected this coming summer is put up, it will be wholly available for the Centennial, if it should be held. And it is

planned so that it can be doubled if necessary, as I understand it. And if that appropriation were made, or any portion of \$150,000, it could simply be added to the work already done. And I have no doubt the committees of the legislature would take that into consideration, and would not be likely to duplicate any sum already given.

MR. ELY.—To make that matter of appropriation plainer, so that there may be no misunderstanding, I will state that if the appropriation of \$50,000 is made to the State Board of Agriculture, we think that is nearly all that will be needed for this exposition. If we find when we make this building that we need any more, we can duplicate it and have two. We don't believe we will want any more. We don't ask \$150,000 for the Centennial and \$50,000 for the Board, which would make \$200,000. We think the one building will answer. But if we find that it will not be sufficient, we can add a little more. That we can find out by fall.

BY THE CHAIR.—Is there anything under the head of miscellaneous business?

MR. FOSTER.—I move to adjourn until half past seven o'clock.

MR. RANDOLPH.—That is pretty late. There is an entertainment in the other hall and the members are invited to be present.

MR. FOSTER.—I will state seven o'clock.

MR. BONHAM.—As we have a little time, there are some members of County Societies, who have a question or two they wish to propose to this body.

MR. FOSTER.—I withdraw my motion for that.

A MEMBER.—I would like to enquire if any of the societies throughout the State have adopted the plan of having one on the committee of judges instead of three? The question has been agitated considerable, and I would like to know.

MR. HURLBERT.—For the last two years we have adopted the plan of one judge upon all the stock, and we find it works very satisfactorily to the exhibitors; more so than a committee of three. We get a man not a resident of our county. To get a committee in our own county of three competent men to make an award, creates more or less dissatisfaction among exhibitors. We have become satisfied by experiment for the last two years, that for one man to judge of stock, gives more general satisfaction, and we find less complaint and dissatisfaction, and we are satisfied with the workings of it. We shall adopt that plan until we are satisfied we are not taking the best plan.

A MEMBER.—How do you appoint him?

MR. HURLBERT.—Our Secretary confers with the Secretaries of other counties and requests them to send us a man to judge of certain classes, horses for instance. We ask them to send us a competent man to judge of such and such classes of stock, and they send us a man.

MR. BONHAM.—How about the compensation?

MR. HURLBERT.—Well, the men they have sent us have been very generous. We have paid their expenses; but the men universally refused to take pay; but we have insisted on paying them something. We have had a man for the beef breeds of cattle, and another for the milk breeds. Last fall we had one man for all classes of cattle. One man reported on all the different breeds.

A MEMBER.—And you had one on horses?

MR. HURLBERT.—Yes, one for all classes of horses.

MR. SEARS.—*Mr. Chairman*, I represent Mahoning county. We have had the plan of one on a committee for several years, and our success has been very gratifying, as far as pleasing the different members of the fair is concerned. Much more so than when we had three. We considered when we started out on this thing, that an expert who knew his business could be selected for each

particular class, who would be a better judge than three men, who were selected at our fairs. In the first place, one man as an expert is generally selected, and the balance of the committee was made up of Tom, Dick, and Harry. Tom, Dick, and Harry, each had a vote. Tom and Dick could outvote Harry, if Harry was the competent man. So no satisfaction was given to the people. If the judge is a competent man, we regard his judgment, as better than that of any three that can generally be picked up. And the patrons of our fair have generally stated that they liked the plan very well. We don't select one man for all classes, for instance large and small hogs. We have one for large breeds and another for small breeds. No man can be selected, but is a little prejudiced against one or the other breed of hogs. One is not sufficient, we feel, for the two classes. So we selected a man for each class; and so on through the different classes of the fair; three or four horse-men through the different classes of horses, and also through the different breeds of cattle; Short-horn breeds, a committee; Holstein breeds, a committee; and so on through the different breeds, and we have found it to work well. When we could not find the right kind of a man in our county, we got a man from another county. In the first place, our Secretary, would ascertain whether these individuals would attend. If so, then the Secretary sent them a complimentary ticket; and that is all the compensation we have ever offered to any outside committee.

MR. WOOD.—We sent out of the county for judges on stock, and the universal judgment was that it worked very well indeed.

A MEMBER.—Did you have a separate man for each class?

MR. WOOD.—We had two men on cattle; one for milk breeds, and one for beef breeds.

MR. BONHAM.—I would like to ask a question. How do the boards like it?

MR. WOOD.—I will say that the year previous, the members of the board worked up their committees in the county. When the day of the fair came, there wasn't one in ten of the committeemen on the ground; but this year the judges were there on the ground, and the board had practically nothing to do.

MR. MURPHY.—Do you permit exhibitors to object to the judges, and if so, then what do you do after that?

MR. WOOD.—The exhibitors know nothing about who is on the committee, and the committee, I would say, are not informed who the stock belongs to.

MR. MURPHY.—We did the same in our county. I represent Butler county. But we always, when we bring our committee out, say, here are our committeemen. Have you any objections to their serving on the committee. Frequently some of them are set off, and we have to fill their places. In the cattle, sheep, and hog ring, there are frequently men who will say, "He is not the kind of man we want." Or, "He is prejudiced," or something of that kind. I know if that system of one judge would operate well, we would be glad to adopt it. And further, I think we would be very willing to pay the railroad fare and the hotel bill of the judges, while they are with us, if we could be satisfied that it would operate well. We have talked of it, but never adopted it.

A MEMBER.—We had a great deal of trouble with the three judge plan. We selected our judges three weeks before hand. When we wanted the committee, they wasn't there. Sometimes there was one, sometimes two, and sometimes not any. Consequently we had to pick up a committee on the grounds; and in this way we found that it makes more dissatisfaction. But in the way we have adopted, in the one man plan, our exhibitors don't know who that man is going to be. Our committee were on the ground, walking about, and examining the stock, before the exhibitors knew it. I requested it, and told him to go among the stock, and not to let the exhibitors know it. In consequence he had a

little the advantage, and had the stock examined before the exhibitors knew who he was.

A MEMBER.—There is another matter that I would like to have spoken of. We have trouble with two classes of persons that want passes to leave the grounds. One class want to run out and in as often as they choose, and sometimes the gate-keepers let persons through without a pass. And then we have a class of exhibitors who desire assistance, and a good deal of it, and they desire passes. Now I would like to know if there is any County Society that has invented any rule that would do justice to all parties concerned, and yet do away with this trouble?

MR. MURPHY.—I believe that I will state to the gentlemen of this Convention, the liberal system that we have adopted in Butler county; and I think my friend Bonham, will bear me out in it. In the first place, we charge ladies nothing. We ask them to come in free. A one dollar ticket will admit a man and all his boys, under 21 years of age; the entire family. Single admission tickets, of course, 25 cents. And then we furnish all the stock men, hay and bedding for nothing. And yet, I guess, our receipts are about as large as in any other county. We get a very large attendance. I believe Mr. Bonham will say, 25,000 on Thursday. We make a good deal in the way of selling refreshment privileges. We made this year over \$2,000. No beer, or liquors of any kind, are sold on the grounds. We let the big snake and everything of that kind go in. Of course our exhibits are open to the world. Nothing is confined to the county. We issue, what is called a bond ticket—a ticket with coupons on it. There is one for each day of the fair, except Monday. When a man comes in with his family, the gate-keeper tears off a coupon. When he goes to the gate to go out, there is a gate-keeper, who keeps checks. He shows him his family ticket, and he receives a check. When he returns, the question is asked, "Have you a family ticket?" He shows it. "Where is your check?" He has got to show his family ticket and give up his check. Since we have adopted the coupon system, we have found it very advantageous. We have taken in more money by it, with less trouble. We have a stamp, and stamp every ticket that goes out.

MR. KETCHUM.—I presume there is another question connected with the carrying on of county fairs that is more vexatious than this, and that is the question of deciding just how to meet out equal and exact justice to all patrons, and at the same time prevent imposition and fraud in the way of using and double using passes and tickets. This is a question that has been discussed and re discussed, and I presume our Assistant Secretary of the State Board of Agriculture has discussed and studied this question more than any of us. I know that he has discussed this question before societies previous to this, and I, for one, would like to hear from him.

MR. FLEMING.—I am not in the habit of saying anything before this Convention, but, as most of you know, I am a pretty good listener, and I generally store up the ideas I gain from the talk of others in the Convention, and make use of them in suggesting new measures that may cover some of the ideas brought out and that may be to the advantage or improvement of the working systems of our fairs. I fear, when I express my ideas about the admission features of our fairs, some of you may think they are not well founded. In the first place I should entirely abolish the complimentary system, and this can be done by having no complimentary tickets printed. I have always believed that the issue of complimentary tickets was productive of more harm than good, because when you compliment Mr. Smith, and fail to remember in

like manner Messrs. Brown, Jones, and some others, the latter, in many cases, feel slighted, and the consequence is, you have made one friend to the fair, but balanced up the account with three enemies. It costs money to run a fair; they are operated in the interest of improvements, whereby the whole people are benefited; the officers serve without compensation, and the people should therefore encourage the institutions by at least the price of an admission, and they should not expect the fair to succeed on dead head tickets. No complimentaries, will gain to the society the price of that many admissions, besides avoiding trouble at the gates by those holding them passing in and out at pleasure.

Of course there are some persons whom it is necessary and right should have free admissions. They are officers and members, persons engaged on committees, the members of the press, and others, who, by reason of their business, pay in another manner, for their admissions. These persons should be provided with a badge, to be worn conspicuously, an insignia of their office or business, and I venture to say you will rarely find the privilege extended by such badge abused by loan or transfer.

I have attended a great many meetings of fair boards, and have heard many discussions on the vexed question of the entrance ticket system, but as yet all the larger fairs, who have been giving serious consideration to the matter, are at sea as to the best and most practical methods.

At a meeting of the Ohio, Michigan and Indiana Fair Circuit, composed of representatives from fairs in Ohio, Michigan and Indiana, the admission feature was presented for discussion, and nearly an entire day was spent in its consideration. It was found that no two fairs were alike in their system, neither were any satisfied they had a system that was not defective and freely abused. It was admitted by all that certain concessions should be made to large exhibitors, who were at considerable expense in arranging their exhibits for display, and especially to the exhibitors of agricultural machinery, for which, by mutual consent, no premiums were offered, yet requiring the constant attention of the representative and his helpers.

Finally it was agreed to recommend the issue and sale of coupon exhibitors tickets, a ticket provided with four or five coupons, according to the number of days the fair was held, each coupon good for one admission. This gave the holder one admission each day of the fair. The price of the ticket was recommended at one dollar. For the help in the machinery department and the grooms in the live stock departments, who would have occasion to pass the gates during the day for tools or to look after repairs, supplies and feed, it was agreed to recommend that blank passes be placed in the hands of the member in charge of the departments, to whom such persons should apply when it became necessary to go out on business connected with their stock or machinery. These blank passes to be filled up with the name of the person to whom issued and the exhibitor represented.

These recommendations were reported back to the several boards and fairs represented, and were adopted by most of them. This made the system more uniform at the larger fairs, and while it worked an improvement over former methods and placed a guard against certain abuses that had been formerly practiced by a few unscrupulous persons, I am frank to say it is far from perfect, and I am inclined to the belief that we shall soon be able to present something still better and perhaps more simple.

One of the great sources of annoyance to fair managers is in the cases of those who purchase the privileges that are sold on the grounds. Many of the fairs

give them and their help the free passage of the gates at all times. That this privilege is abused there is no doubt. Other fairs call upon them every evening and supply the tickets necessary for the next day. This is also abused. Now, the Ohio State Fair has adopted a system for such persons, that I would recommend to every fair in the State. I believe it is perfect and I know that it works satisfactorily to both purchasers and the Board. It avoids the great annoyance occasioned by other systems, and it cannot be abused. It is this, to every purchaser, we allow ten per cent. of the purchase money in single admission tickets, for him to use as he pleases. If that be not enough he must pay at the gates when the supply is exhausted. If it be too many, he can dispose of the surplus as he chooses. The beauty of this arrangement is, that as soon as contracts are closed and the money paid, there is no further bother, and the tickets not being issued until payment is made, it occasions promptness in this direction, which is an important item to our fairs.

One gentleman says that at his fair they issue gate checks, that is, a person buying a ticket and coming through the gate, can, if he wishes, procure a gate check, go out and return again on this check. I should consider this a very faulty system, and one that is liable to cost any fair adopting it, a good many dollars.

The general admission system of our fairs is susceptible of improvements, and I hope we shall continue to improve until every objection shall be overcome and the system be simplified, perfected and made safe.

MR. MURPHY.—With your permission, I will say a few words on the subject of complimentary tickets. We do issue a few. We give to each member of the board a certain number.

A MEMBER.—How many?

MR. MURPHY.—About 10 or 12, but they are generally used by men outside of the county. They are given to influential men outside of the county. I believe that it will pay to do so. Gentlemen will come who have never been to our fair, and are so well pleased that they will go away and tell their neighbors; and the next year, we will reap the reward. Excepting in that wicked Democratic county, we give to all the ministers of the gospel a complimentary ticket; and also to the newspaper men.

MR. HANCOCK.—I would like to relate my experience. I think I have pretty thoroughly studied this matter and seen it pretty well tried. We used to have the plan named by this gentleman, of giving family tickets, admitting a man and his family, his wife and children under 21 years of age. But it was astonishing how large the families were. Wagon loads would come up, with blondes and brunettes, red-headed and black headed, and all belonging to the same family, and so nearly of the same size that there must have been a half dozen pairs of twins in the family. So when we came to pay premiums we had no money. Families had come in with a wagon load for a dollar. We found that plan wouldn't work. We were being imposed upon. And I expect we are as honest as anywhere. The next plan we adopted was selling five tickets for a dollar. We thought we had about struck the right plan. But when we came to sell tickets at the fairs, we had a lot of scalpers around who would buy their tickets inside at five for a dollar, and sell them on the outside for 25 cents apiece. An energetic man could in this way make ten or fifteen dollars in a day. This plan wouldn't do. All, except children, when they come in now pay their 25 cents in good hard cash. Ladies too. If they go out and come back, it is another 25 cents. Our fair grounds are situated nearly a mile from the town.

A MEMBER.—Are exhibitors treated in the same way?

MR. HANCOCK —Yes sir. Exhibitors are charged one dollar. That makes them a member of the society; and for that they get their tickets, just as many as anybody else. That entitles them to a vote and that is their only privilege. If the exhibitor wants to leave the grounds, he pays his money. It looks like a hardship for the man who brings his stock to pay as the others do. If a man brought stock and had helpers, it would be a hardship for them to expend money for that. We adopted this rule. The superintendent of the agricultural department, after the exhibitors are all on the ground, makes an inspection and determines how many men each man is entitled to for that amount of stock. They then say to the exhibitor, "You are entitled to one, two, or three men. But you pay for these men every day, when they come in. When the fair is over, we will make you a rebate, so that there may be no passes used in running back and forth." The exhibitor and his helpers pay as any person else; but on the recommendation of the superintendent of that department, we rebate the entrance fee. That is satisfactory to the board, but not so satisfactory to the exhibitors. But it seems to me that that comes the nearest of anything to being justice. So far as those who take leases on the grounds are concerned, we advertise the privileges in this way: We advertise a certain number of privileges for sale, which we sell for a year, or five years perhaps. We say this includes a free admission. But he makes his bid on the ground that he pays for all his help that goes in. The complimentary are under the control of the secretary; but he is only authorized to give complimentary to the judges on stock and to the members of boards in adjoining counties, or in the State. We do not admit the ministers free.

Convention adjourned to 7 o'clock p. m.

EVENING SESSION.

The Convention was called to order by the Chair, at 7:40 o'clock. There being no unfinished business, the Chair announced that the election of five members to the Board was in order.

A MEMBER.—I move we proceed to the election immediately.

MR. MURPHY.—I offered this forenoon the name of Senator Sullivan as a candidate for member of the Board. Just after we adjourned this afternoon he told me if he was not present to withdraw his name, to do so for him. So his name is not before you, gentlemen, in the list of nominations. If there are no statutes prohibiting it, I would move, that as there are but five candidates, they be elected by acclamation.

A MEMBER.—I move that Mr. Murphy be authorized to cast the vote of the Convention for the five names.

A MEMBER.—If I recollect right, that same maneuver was tried last year, and determined to be illegal. Why try it again?

A MEMBER.—There were more candidates last year.

A MEMBER.—Universal custom will uphold this, if by unanimous consent. If any member objects, we cannot do so. But the custom has been very thoroughly established that this procedure is legal, where it is provided it must be by ballot or unanimous consent.

Objection being made, the Convention proceeded to ballot for the five candidates.

A MEMBER.—If it is in order, I would like to make an inquiry concerning the casting of a vote by a citizen of Washington county, who is present, and authorized by the President of that Society, to cast that vote. He asks if he is entitled to vote.

BY THE CHAIR.—I think he is.

THE SECRETARY.—There is a regular proxy of Judge Cutter. There is a letter authorizing him to cast the vote.

The following members were elected for a term of two years:

L. B. Harris, Wyandot county; J. H. Brigham, Fulton county; Jno. Pow, Columbiana county; T. P. Shields, Union county; S. H. Hurst, Ross county.

On motion of Mr. Bonham, a vote of thanks was tendered to the Senate for the use of their chamber and also to the Sergeant at-arms.

On motion of Mr. Foster, the Convention adjourned.

THIRTY-SIXTH

OHIO STATE FAIR,

HELD AT COLUMBUS,

AUGUST 31st, AND SEPTEMBER 1st, 2^d, 3^d, 4th, 1885.

The Thirty-Sixth Annual Ohio State Fair, in point of interest and attraction, was equal to any of the fairs that have been held under the auspices of the State Board; in fact in many of the departments the displays were superior, and the number of new articles and inventions quite noticeable. In the departments of live stock every class was represented, and by none but the very best animals.

In the departments of mechanics, domestic manufactures, farm products, fruits, flowers, and fine arts, all the available exhibition space was occupied, and each of these departments presented a fine show, that was attractive and instructive.

The department of agricultural machinery was a grand show in itself. Never before was there such a large variety of agricultural machinery and implements shown in one collection. The numerous private exhibition buildings, erected by prominent manufacturers, were filled with machinery that was kept constantly in operation, and exhibited and explained to thousands of interested farmers.

Visitors were well pleased with the show in general, the only complaint being that the time was too short for a thorough examination of the numerous meritorious exhibits.

During the fair the several departments were in charge of members and officers of the Board, as follows:

C. D. BAILEY, <i>President</i> , Gallipolis.....	General Headquarters.
J. C. LEVERING, <i>Treasurer</i> , Leverings.....	Tickets and Admission.
W. I. CHAMBERLAIN, <i>Secretary</i> , Columbus.....	Executive.
J. W. FLEMING, <i>Assistant Secretary</i> , Columbus.....	Executive.
L. B. HARRIS, Upper Sandusky.....	Horses.
WM. S. FOSTER, Urbana.....	Cattle.
JOHN POW, Salem.....	Sheep and Farm Products.

L. N. BONHAM, Oxford	Swine.
S. H. HURST, Chillicothe	Horticulture and Fine Arts.
J. H. BRIGHAM, Delta	Machinery, Implements and Poultry.
T. P. SHIELDS, Watkins	Manufacturers' Products.
H. TALCOTT, Jefferson ..	Textile Fabrics and Domestic Manufactures.

It is expected that the Fair of 1886 will be held upon the new grounds, purchased by the State Board of Agriculture, and now being elegantly fitted up with spacious and commodious exhibition buildings, show rings, grand stand and speed ring, at a total cost by next September of over \$150,000.

ENTRIES, AWARDS, AND COMMITTEE REPORTS.

HORSES—THOROUGHBREDS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion 4 years and over.</i>			
Jos. Logsdon, Upper Sandusky.....	Waverly, Jr	First	\$35 00
Dr. Wm. Estep, Loydsville.....	Judge Spofford.....		
<i>Stallion 3 years and under 4.</i>			
J. H. Thompson, Washington C. H.....	Dad	First	20 00
<i>Stallion 2 years and under 3.</i>			
Wm. Williams, Columbus	John Alexander	First	15 00
<i>Stallion 1 year and under 2.</i>			
Jas. Alexander, agent for A. N. Ackerman, Col.....		First	10 00
<i>Mare 4 years and over.</i>			
Jno. H. Thompson, Washington C. H.....	Lady Reber.....	First	20 00
Jas. Alexander, agent for A. N. Ackermann, Col.....	Westfall	Second	10 00
F. R. Stewart, Flint.....			
<i>Mare 3 years and under 4.</i>			
Wm. Williams, Columbus	Faith	First	20 00
Chas. E. Brossman, Lithopolis.....	Pallie	Second	10 00
<i>Mare 2 years and under 3.</i>			
Wm. Williams, Columbus		First	15 00
Jno. H. Thompson, Washington C. H.....		Second	8 00
<i>Filly 1 year and under 2.</i>			
Noyes & Irwin.....	Belle of Marion.....	First	10 00
<i>Brood mare with foal by her side.</i>			
Henry C. Taylor, Columbus	Louise Gwynne.....	First	25 00

HORSES.—ROADSTERS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion 4 years and over.</i>			
Harris & Williams, Upper Sandusky	Ambassador.....	First	\$25 00
P. G. Palmer, Millersburg	American Boy		
C. C. Smith, Plain City	Maj. Moore		
M. L. Burnham, Mechanicsburg.....	Black Jim		
B. W. Lawson, London	Matland, Jr	Second	20 00
Langford Bros., Mt. Vernon.....	Almont		
<i>Stallion 3 years and under 4.</i>			
Jno. C. Hanum, Groveport.....	Tony Hamilton.....		
Samuel Belknap, Columbus	Orange Bud		
F. Wardell, Circleville.....		Second	10 00
A. W. Underwood, London.....	Happy Hinkle.....	First	20 00
Langford Bros., Mt. Vernon.....	Jerome Almont.....		
<i>Stallion 2 years and under 3.</i>			
John Beal, Port Williams.....			
J. D. Steddom, Wilmington			
P. G. Palmer, Millersburg	Favorite		
C. C. Smith, Plain City	Garfield	First	15 00
M. L. Burnham, Mechanicsburg.....	Calmore		
A. L. Grover, Mechanicsburg.....	Deceiver	Second	8 00
<i>Stallion 1 year and under 2.</i>			
P. G. Palmer, Millersburg	J. B.....		
Jesse M. Elliott, Alton	Miller		
Wm. J. Smith, Gambier	Archibald Chief	First	10 00
<i>Mare 4 years and over.</i>			
B. M. Pugh, Basil.....			
A. Davidson, Lancaster.....			
R. R. Armstead, Dublin.....			
H. Turner, Pleasant Corners.....	Startle		
D. S. King, Wilmington	Zenobia		
L. G. Delano, Kinnikinnick	Kizzie K	Second	10 00
Jonas Pickens, Circleville.....	Sorrel M	First	20 00
Geo. H. German, Franklin, Mich.....	Star		
<i>Mare 3 years and under 4.</i>			
John Beal, Port William			
A. R. Miller, Pataskala.....	Nellie M		
C. C. Smith, Plain City	Linnett	Second	10 00
L. Karns, Camp Chase.....	Maud S		
M. L. Burnham, Mechanicsburg.....	Lady Light Foot.....	First	20 00
<i>Mare 2 years and under 3.</i>			
P. G. Palmer, Millersburg	Maud A.....		
A. R. Miller, Pataskala	Orange Girl	First	15 00
<i>Filly 1 year and under 2.</i>			
Wm. Wagner, Dublin.....	Mollie Rock.....		
Jno. C. Hanum, Groveport.....	Vice	Second	5 00
C. G. Postle, Camp Chase.....			
A. R. Miller, Pataskala	Minnie Zerk		
same	Emma Abbott	First	10 00
P. G. Palmer, Millersburg.....	Fannie Trot		
same	Lucy Palmer.....		
<i>Brood Mare with foal by her side.</i>			
A. Davidson, Lancaster			
F. L. Postle, Camp Chase.....		First	25 00
A. R. Miller, Pataskala.....	Sallie W		
same	Sada Thayer	Second	15 00
W. R. Hendrickson, Portsmouth.....	Mambrino Bird.....		
Wm. J. Smith, Gambier.....	Josephine		

HORSES.—HORSES FOR GENERAL PURPOSES.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
Wm. Wagner, Dublin.....	Robin Hood.....	.....	.....
Dwight Gay, Columbus.....	Duke of Cleveland.....	.....	.....
same.....	Prince Albert.....	.....	.....
Ed. Courtright, Galloway.....	Hercules.....	.....	.....
same.....	Black Frank.....	.....	.....
John Beal, Port William.....	.....	Second.....	\$20 00
N. S. Tussick, Circleville.....	.....	.....	.....
Armstrong & Stanley, Alliance.....	.....	First.....	35 00
W. J. & O. M. Lynn, Canfield.....	Capt. McGregor.....	.....	.....
Jno. V. Newton & Co., Toledo.....	Mambrino Prince.....	.....	.....
W. C. Fair, Cleveland.....	Cardinal.....	.....	.....
E. T. Hillhouse, Columbus.....	Allendale.....	.....	.....
<i>Stallion 3 years and under 4.</i>			
Dwight Gay, Columbus.....	Frank Herod.....	Second.....	10 00
same.....	Sportsman.....	.....	.....
Phil. Pontius, Groveport.....	Glory.....	.....	.....
J. W. Mayfield, Delaware.....	Young Lion.....	.....	.....
Geo. Elliott, Columbus.....	Doctor E.....	.....	.....
Lee Foster, South Charleston.....	.....	.....	.....
F. L. Ryant, Constantia.....	Willoughby.....	First.....	20 00
<i>Stallion 2 years and under 3.</i>			
R. W. Purdum, Dublin.....	Diamond Joe.....	Second.....	8 00
Dwight Gay, Columbus.....	Columbus.....	.....	.....
John Beal, Port William.....	.....	First.....	15 00
Frank Jack, Lebanon.....	Doctor Robert.....	.....	.....
R. F. Elliott, Alton.....	.....	.....	.....
<i>Stallion 1 year and under 2.</i>			
J. M. Chambers, Avenue.....	Dick.....	.....	.....
B. F. Elliott, Alton.....	Enoch.....	.....	.....
Fide Koerner, Alton.....	Blue Back.....	Second.....	5 00
Bell Bros., Wooster.....	Derwent.....	First.....	10 00
<i>Mare 5 years and over.</i>			
Dwight Gay, Columbus.....	.....	.....	.....
J. D. Steddom, Wilmington.....	.....	First.....	20 00
W. R. Henderson, Portsmouth.....	.....	Second.....	10 00
<i>Mare 3 years and under 4.</i>			
R. W. Purdum, Dublin.....	Julia Thomas.....	First.....	20 00
John Beal, Port William.....	.....	.....	.....
<i>Mare 2 years and under 3.</i>			
C. Ubanks, Dublin.....	Nell.....	First.....	15 00
<i>Filly 1 year and under 2.</i>			
R. W. Purdum, Dublin.....	Abdalah May.....	.....	.....
A. R. Miller, Pataskala.....	Sada B.....	Second.....	5 00
W. R. Hendrickson, Portsmouth.....	Mambrino Maud.....	First.....	10 00
<i>Brood mare with foal by her side.</i>			
R. W. Purdum, Dublin.....	Nettie Moore.....	.....	.....
C. Ubanks, Dublin.....	Jennie.....	.....	.....
A. R. Miller, Pataskala.....	Pilot Maid.....	.....	.....
Eli Gatten, Galloway.....	.....	.....	.....
B. F. Elliott, Alton.....	Nettie.....	.....	.....

HORSES.—CLYDESDALE AND ENGLISH DRAFT HORSES.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion 4 years and over.</i>			
Guthrie & Moore, Marion	Fair Trade.....	.....	.....
Ed. Courtwright, Galloway.....	Bank of England.....	.....	.....
same	Young Scotland .....	.....	.....
C. O. Taylor, Urbana	Ben Loman.....	First	\$35 00
C. W. Rohr, Groveport	Scotland, Jr .....	.....	.....
Albert Field, Milflinville.....	Young Lord Aberdeen .....	.....	.....
Waples & Clelland, La Rue.....	Alexander .....	.....	.....
A. J. Goldsmith, Shiloh .....	.....	.....	.....
J. P. Neer, Urbana	Dandy	Second	25 00
Swisher, Paddock & Co., Cambellstown.....	.....	.....	.....
<i>Stallion 3 years and under 4.</i>			
Guthrie & Moore, Marion.....	Advocate .....	.....	.....
same .....	.....	.....	.....
W. R. Hunter, Avenue	Monarch.....	.....	.....
Bell Bros., Wooster	King of the Thomas.....	.....	.....
Swisher, Paddock & Co., Cambellstown.....	Robin the Laird	First	20 00
same	Kildanaw.....	Second	10 00
<i>Stallion 2 years and under 3.</i>			
Ed. Courtwright, Galloway	Bank of England, Jr.....	.....	.....
Lester Bidwell, West Jefferson.....	Tom	First	15 00
Bell Bros., Wooster	Good Luck	Second	8 00
<i>Stallion 1 year and under 2.</i>			
Adam Koerner, Alton	Conolel .....	.....	.....
Bell Bros., Wooster	Golden Drop	Second	10 00
same	Coinage	First	5 00
J. S. Bower, Plain City	Dock Livingston.....	.....	.....
B. F. Bowdre, New Dover	King .....	.....	.....
<i>Mare 4 years and over.</i>			
John Koerner, Alton	Mollie.....	.....	.....
J. S. Bower, Plain City.....	Doll	Second	10 00
Jas. Mahon, Mansfield.....	.....	First	20 00
<i>Mare 3 years and under 4.</i>			
W. R. Hunter, Avenue	Clyde	Second	10 00
J. S. Bower, Plain City.....	Collie	First	20 00
<i>Mare 2 years and under 3.</i>			
Lester Bidwell, West Jefferson.....	Mollie.....	First	15 00
Wm. West, Maringo .....	.....	Second	8 00
<i>Filly 1 year and under 2.</i>			
Bell Bros., Wooster .....	.....	.....	.....
Wm. West, Maringo .....	.....	First	10 00
<i>Brood Mare with foal by her side.</i>			
John Koerner, Alton .....	.....	Second	15 00
B. F. Bowdre, New Dover .....	.....	First	25 00

PERCHERON AND NORMAN DRAFT HORSES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion 4 years and over.</i>			
E. McBride, Lima	Lamartine .....	.....	.....
C. O. Taylor, Urbana	General Rosecrans .....	.....	.....
Albert Field, Mifflinville	Butol .....	.....	.....
J. J. Vance, Ostrander	Regulus	Second..	\$20 00
W. C. Baum, Duval	Chas. Manier .....	.....	.....
R. K. Willis, Lewis Center	Champion .....	.....	.....
D. K. & Jos. Sharp, Millersburg	Maxwell .....	.....	.....
same .....	.....	.....	.....
The New Carlisle Breeding and Importing Co., J. Q. Smith, Secretary	Appollyon .....	.....	.....
Dr. I. K. Scott, La Rue	Hercules	First.....	35 00
John V. Newton & Co., Toledo	Hengis .....	.....	.....
<i>Stallion 3 years and under 4.</i>			
Davis & Smith, West Canaan .....	.....	Second..	10 00
Swisher, Paddock & Co., Cambellstown	Ohio	First.....	20 00
<i>Stallion 2 years and under 3.</i>			
W. R. Hunter, Avenue	Sedan	First.....	15 00
Swisher, Paddock & Co., Cambellstown	Favorite	Second..	8 00
<i>Stallion 1 year and under 2.</i>			
Wm. Patterson, Hilliard .....	.....	.....	.....
Benjamin E. Jones, Kerrsville .....	.....	.....	.....
James T. Miller, Marble Cliff	Brilliant Boy .....	.....	.....
J. J. Vance, Ostrander	Duke	First.....	10 00
M. J. Pegg, Mifflinville	Wm. Curtis	Second..	5 00
<i>Mare 4 years and over.</i>			
James T. Miller, Marble Cliff	Adeal	First.....	20 00
<i>Mare 2 years and under 3.</i>			
James T. Miller, Marble Cliff	Ada	First.....	15 00
<i>Filly 1 year and under 2.</i>			
Orrville Westbrook, Stantontown .....	.....	First.....	10 00
<i>Brood mare with foal by her side.</i>			
James T. Miller, Marble Cliff	Margueretta	First.....	25 00
J. M. Chambers, Avenue	Topsy	Second..	15 00

GELDINGS AND MARES FOR LIGHT HARNESS.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Mare or gelding 4 years and over.</i>			
Samuel Belknap, Columbus	Jim. Brown .....	.....	.....
Frank Jack, Lebanon .....	.....	First.....	\$20 00
Henry Turner, Pleasant Corners	Sleepy Jim .....	.....	.....
W. W. Freeman, Columbus	Black Charlie	Second..	10
Jason Firestone, Columbus	Hylas .....	.....	.....

GELDINGS AND MARES FOR LIGHT HARNESS—Continued.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Mare or gelding 4 years and over—Continued.</i>			
J. Murray Brown, Columbus	Tony Bennett.....		
D. S. King, Wilmington	Road Master		
G. W. Crawford, Newark			
<i>Mare or gelding 3 years and under 4.</i>			
Henry Turner, Pleasant Corners	Fannie.....		
Gus. Johns, Columbus.....	Linnett.....	Second..	\$8 00
C. C. Smith, Plain City	Frank S.....	First.....	15 00
Frank R. Stewart, Columbus.....	Maud L.....		
A. Lybarger, Columbus.....	Billy L.....		
J. A. Bell, Ashley			

SADDLE HORSES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion, mare, or gelding for saddle.</i>			
John J. Maxon, Gallipolis	Selim	First.....	\$30 00
Frank Tallmadge, Columbus	Dandy		
Dr. C. F. Clark, Columbus.....	Dick	Second..	25 00
J. B. Vause, Lockburn	Harry Gold Dust.....		
Frank Mitchell, London	Jeff		
Frank Appleman, Newark	Billy		
A. B. Appleman, Columbus.....			
G. W. Crawford, Newark			

MATCHED HORSES AND MARES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Pair of coach geldings or mares.</i>			
D. Heffner, Circleville.....		First.....	\$25 00
Daniel Stein, Circleville			
<i>Pair of farm or draft geldings or mares.</i>			
John Metzger, Circleville.....		Second..	15 00
John Koerner, Alton		First.....	25 00
<i>Pair light harness geldings or mares.</i>			
Orrville Westbrook, Stantontown.....		Second..	15 00
A. R. Appleman, Columbus.....		First.....	25 00
B. M. Pugh, Brasil.....			

SWEEPSTAKES FOR THOROUGHBREDS.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion of any age.</i>			
Wm. Williams, Columbus.....	.....	.....	.....
J. H. Thompson, Washington C. H.....	Dad.....	.....	.....
Dr. Wm. Estep, Loydsville.....	Judge Spoford.....	.....	.....
Jos. Logsdon, Upper Sandusky.....	Waverly, Jr.....	First.....	\$40 00
<i>Mare of any age.</i>			
Jos. Alexander, ag't for A. N. Ackerman, Col'bus	Silence.....	.....	.....
same Wm. Williams, Columbus.....	Faith.....	.....	.....
H. C. Taylor, Columbus.....	Grace Lee.....	First.....	30 00
J. H. Thompson, Washington C. H.....	Louise Gwynne.....	.....	.....
	Lady Reber.....	.....	.....

CLYDESDALE AND ENGLISH DRAFT SWEEPSTAKES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion of any age.</i>			
Guthrie & Moore, Marlon .....	.....	.....	.....
Ed. Courtright, Galloway	Bank of England.....	.....	.....
Waples & Clelland, La Rue	Alexander	First.....	\$40 00
Swisher, Paddock & Co., Cambellstown.....	Kildanan.....	.....	.....
<i>Mare of any age.</i>			
J. S. Bower, Plain City	Doll .....	.....	.....
James Mahon, Mansfield.....	.....	First.....	30 00

PERCHERON OR NORMAN DRAFT SWEEPSTAKES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion of any age.</i>			
E. McBride, Lima .....	.....	.....	.....
W. E. Baum, Du Val	Regulus .....	.....	.....
R. K. Willis, Lewis Center	Chas. Manler.....	.....	.....
D. K. & Jos. Sharp, Millersburg.....	Champion .....	.....	.....
same	Marvel .....	.....	.....
The New Carlisle Breeding and Importing Co.,	.....	.....	.....
J. Q. Smith, Secretary, New Carlisle.....	Appollyon .....	.....	.....
Dr. I. K. Scott, LaRue	Hercules.....	.....	.....
John V. Newton & Co., Toledo.....	Hengis	First.....	\$40 00
Swisher, Paddock & Co., Cambellstown.....	Ohio .....	.....	.....

GENERAL PURPOSE AND ROADSTER SWEEPSTAKES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Stallion with 5 of his colts.</i>			
P. G. Palmer, Millersburg.....	American Boy	First.....	
<i>Stallion of any age.</i>			
Edward Courtright, Galloway			
John J. Maxon, Gallipolis	Seline		
Harris & Williams, Upper Sandusky	Ambassador		
P. G. Palmer, Millersburg.....	American Boy		
M. L. Burnham, Mechanicsburg.....	Black Jim		
B. W. Lawson, London	Maitland, Jr.	First.....	\$10 00
W. J. & O. M. Lynn, Canfield.....	Capt. McGregor		
J. V. Newton, Toledo	Mambrino Prince.....		
W. C. Fair, Cleveland.....	Cardinal		
E. T. Hillhouse, Columbus	Allendale.....		
<i>Mare of any age.</i>			
C. Ubanks, Dublin			
A. R. Miller, Pataskala.....	Nellie M.....		
J. D. Steddom, Wilmington			
L. G. Delano, Kinnikinnick	Lizzie K	First.....	30 00
B. F. Ewalt, Alton.....	Nettie.....		

JACKS AND MULES.

Owner's name and postoffice.	Name of animal.	Premium.	Amount.
<i>Pair mules 3 years and over.</i>			
H. W. Elliott, Centerburg.....		First.....	\$25 00
Thos. Brandige, Kingston.....		Second..	15 00
<i>Mule 2 years and over.</i>			
Thos. Brandige, Kingston.....		First.....	15 00

SUMMARY OF THE RACES.

BREEDERS' STAKE.

M. J. Leonard & Co., Columbus, b. f. Grace Lee	2
Wm. Williams, Columbus, g. c. John Alexander.....	3
John H. Thompson, Washington C. H.....	1
Time: $\frac{3}{4}$ mile, 1.24.	

RUNNING—ONE MILE DASH.

J. H. Thompson, Washington C. H.. b. m. Lady Reber	1
Wink Harriman, Marion, ch. m. Mollie Thomas	3
Joseph Logsdon, Upper Sandusky, br. s. Waverly, Jr.....	4
J. P. Biddleman, Columbus, b. g. Embargo.....	5
James Peene, Jefferson, br. g. Geo. Angus	2
R. B. Eaton, Bucyrus, br. g. Sir Archie.....	
Time: 1.46.	

TROTTING—3:30 CLASS.

J. L. McCarthy, Detroit, Michigan, ch. m. Ianthe.....	2 2
John Call, Cleveland, b. g. Edward B	7 10 4
E. R. Thompson, Delaware, b. s. Stolen Waters.....	9 9 8
J. C. Quinn, Chillicothe, b. g. Protection.....	1 1 1
M. Spellacy, Detroit, Michigan, ch. m. Mollie Harrington.....	5 5 9
Jacob Knauber, Cincinnati, br. m. Ossie B.....	10 6 10
Lynn Bros., Canfield, b. g. Lynn W.....	4 3 7
W. H. Saunders, Clyde, b. g. William C.....	6 4 6
Scott & Jordon, Findlay, b. m. Ada.....	3 7 5
A. E. Mayer, Columbus, b. m. Jessie Ballard.....	8 8 2
Time: 2.23, 2.35¼, 2.34.	

TROTTING STALLIONS.

Harris & Williams, Uper Sandusky, bk. s. Ambassador.....	2 dr.
W. W. Richardson, Akron, ch. s. Sunshine.....	3 2 2
K. K. Bugher, Glendale, bk. s. Tom Rogers.....	1 1 1
Langford Bros., Mt. Vernon, bk. s. Almont Gift.....	4 3 3
Time: 2.33½, 2.28½, 2.27.	

RUNNING MILE HEATS 2 IN 3.

Wink Harriman, Marion, s. m. Mollie Thomas.....	3 3
J. H. Thompson, Washington C. H., b. m. Lady Reber.....	1 1
James Peene, Jefferson, br. g. George Angus.....	2 2
Time: 1.46, 1.48½.	

TROTTING—2:35 CLASS.

Charles M. Spencer, Pittsburgh, Pa., b. m. Trapagan	7 10 8
G. L. Patterson, Mansfield, b. m. Alvira.....	8 6 4
Robert E. Boyle, St. Martins, b. g. Emmet B	9 9 6
P. K. Scott, Napoleon, b. g. Almont General.....	5 4 3
J. A. Juvinall, Upper Sandusky, br. g. Freddie J	1 1 1
A. T. Tallman, Bellefontaine, b. s. St. Lawrence Chief.....	6 5 10
C. W. Kinney, Sabina, General Siegel.....	10 7 9
W. A. McConnell, Columbus, bk. g. Hiram Miller.....	4 2 2
Smith & Jordon, Findlay, g. g. Fred. Moran.....	3 3 7
A. B. Grove, Newark, bk. s. Groves' Blue Bull	2 8 5
N. D. Amos, Sabina, b. s. Almont	11 dis.
Time: 2.29½, 2.28, 2.28.	

PACING—2:25 CLASS.

O. A. Simons, Ft. Wayne, Ind., br. m. Daisy Scott.....	6 8 7 10 dr.
Frank Alexander, Columbus, b. m. Flora Wilkes	4 7 1 2 5
A. A. Hanley, Pt. Pleasant, W. Va., s. g. Jesse H.....	11 3 5 6 dr.
H. Hagmaier, Carey, r. g. Excelsior	9 12 dr. — —
D. P. Collins, Pittsburgh, Pa., br. g. Frank W.....	12 2 3 3 2
Thos. Tanner, Delaware, s. g. Gen. Hardee	7 10 9 7 6
E. T. Hillhouse, Columbus, b. g. Frank Hilles	13 dr. — —
Wm. Bell, Cardington, s. g. Sand Roy.....	8 11 11 8 8
Scott & Jordon, Findlay, b. g. Billy Fleming.....	5 4 4 5 4
Richard Hunt, Anderson, Indiana, b. s. American Boy.....	2 1 2 9 3
G. M. Spencer, Pittsburgh, Pa., b. g. Billy F.....	10 9 6 11 7
J. L. McCarthy, Detroit, Mich., br. g. Little Mack.....	1 6 10 1 1
F. Hotsington, N. Lewisburgh, d. g. High Jack.....	3 5 8 4 9
Time: 2.24¾, 2.28, 2.27, 2.27¼, 2.26.	

TROTTING—2:25 CLASS.

Frank Catlyn, Jackson Mich., b. m. Lady M.....	4	3	no h't	8	7
W. S. Humphrey, Cheboygan, Mich., bk. m. Mollie Harris	1	8	"	1	2
A. T. Tallman, Bellefontaine, b. g. Almont.....	7	6	"	7	6
J. B. Baugh, Detroit, Mich., bk. g. Black Cloud, Jr.....	3	2	"	2	5
T. W. McCue, Akron, b. g. Minor.....	5	7	"	6	8
J. L. McCarthy, Detroit, Mich., b. m. Lady Brownell.....	2	1	"	3	4
W. H. Boyse, Fisher's, Ind., br. g. Little Tommy.....	6	5	"	5	3
Wm. Shidler, Ashland, g. g. Gray Dave	8	4	"	4	1

Time: 2.28½, 2.27¾, 2.29, 2.26.

TROTTING—3:00 CLASS.

Thos. Tanner, Delaware, b. g. Clipper.....	7	7	6	4
Wm. Lake, Flint, Mich., ch. g. Rainbow.....	4	1	1	1
J. L. McCarthy, Detroit, Mich., ch. m. Ianthie	2	8	5	2
D. S. King, Wilmington, b. s. Surveyor.....	5	6	7dr.	
Peter Brown, Pittsburgh, Pa., bk. m. Kate Preston.....	1	2	4	3
Scott Moore, Anderson, Ind., br. s. Judge Pierce.....	3	5	3	6
M. O. Stokes, London, w. g. John W.	6	4	2	5

Time: 2.30¼, 2.31¼, 2.31, 2.34.

ENTRIES, PEDIGREES, AND AWARDS.

CATTLE.—SHORTHORNS.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 3 years and over.</i>		
D. W. Brown.....	Tiffin	Tippecanoe, 34004.....
James T. Miller.....	Marble Cliff.....	Donald Duke, 43289
D. D. Richards.....	Newark.....	Young Rocket, 54416..
N. S. Olin & Son.....	Streetsboro.....	8th Duke of Lebanon
James R. Anderson & Son.....	Anderson.....	Enterprise.....
C. C. Walker & Son.....	New Madison.....	Aciam Sharon 8d.....
<i>Bull 2 years and under 3.</i>		
D. W. Brown.....	Tiffin	Col. Judy, 47694.....
J. O. Edwards & Son	Youngstown	Airdrie of Pleasant Hill 3d, 49708...
Peter Boehm	Columbus	Hook Hocking 2d.....
J. M. Black.....	Hanover.....	2d Phyllis Lad.....
<i>Bull 1 year and under 2.</i>		
J. O. Edwards & Son	Youngstown	Airdrie of Pleasant Hill 8th, 61471...
Harness Renick	Circleville.....	Darby Chief
George Watson & Son.....	South Charleston.....	Machem
George H. German.....	Franklin, Michigan.....	3d Tea, Rose Duke
D. D. Richards.....	Newark	Louans Mazurka, 416
N. S. Olin & Son	Streetsboro.....	Matilda's Grand Duke.....
J. M. Black	Hanover	Baron Wiley 4th
<i>Bull calf.</i>		
D. W. Brown.....	Tiffin	Grover.....
same	"	Logan.....
J. O. Edwards & Son	Youngstown	Richmond
George Watson & Son	South Charleston.....	Harold
same	"	Daniel
same	"	David
C. C. Walker & Son.....	New Madison.....	Aciam 2d
George H. German	Franklin, Michigan..	"
D. D. Richards.....	Newark	Duke of Belle Walnut
same	"	Louan Airdrie's Rocket
Amos Bowman.....	Somerset.....	Forester.....
James R. Anderson & Sons	Anderson	Not named.....
same	"	"
same	"	"
J. M. Black	Hanover.....	Zerda.....
<i>Cow 4 years and over.</i>		
D. W. Brown.....	Tiffin	Tippecanoe Rose
same	"	Nellie.....
Peter Boehm.....	Columbus.....	Kitty 2d.....
James T. Miller.....	Marble Cliff.....	Lass of Plainview 5th
George Watson & Son.....	South Charleston.....	Minora
C. C. Walker & Son.....	New Madison.....	Profitable 16th
N. S. Olin & Son.....	Streetsboro.....	Lady Florence.....
same	"	Lady Ruth.....
James R. Anderson & Sons	Anderson.....	Jennie May.....
same	"	Minnie Springdale 2d.....
<i>Cow 5 years and under 4.</i>		
D. W. Brown	Tiffin	Sallie Bell
George Watson & Son	South Charleston.....	Pixie 6th, Vol. 26
C. C. Walker & Son.....	New Madison	Profitable 21st.....
D. D. Richards.....	Newark	Minnie's Gem

ENTRIES, PEDIGREES, AND AWARDS.

CATTLE.—SHORTHORNS.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Realin Prince, 26493.....	Dianthus 3d.....	Hannibal, 6838.....	Third...	\$10 00
Duke 2d, 25318.....	Red Rose 3d.....	Marquis, 70012.....	.....	.....
Rocket, 34285.....	Placida Bell.....	Mazurka's Judge, 33256.....	.....	.....
Gwynne's Duke, 35121.....	Lady Jane 26th.....	Royal Britton, 15392.....	.....	.....
Springdale Airdrie, 37035.....	Matilda 15th.....	Washington Airdrie, 13100.....	First.....	35 00
4th Airdrie of Sharon, 8047.....	Poppy 10th.....	Airdrie 3d, 646.....	Second.....	20 00
Breastplate, 22226.....	Tippecanoe Rose.....	Baron Booth, 25598.....	Third.....	10 00
Washington Airdrie, 13110.....	Maud.....	Airdrie 2d, 11267.....	First.....	35 00
Scioto Sharon, 40884.....	Kitty 2d.....	Magnolia's Maz. D., 52589.....	Second.....	20 00
2d Duke of Barrington, 5877.....	Phillis Lass.....	Bates Lad, 7207.....	.....	.....
Airdrie of Ple'at H. 2d, 49707.....	Elma Moore 5th.....	Airdrie of Pleasant Hill.....	First.....	20 00
Baron Fawsley, 7th Vol., 25.....	Darby Belle 2d.....	5th Count of Onelda.....	.....	.....
Earl of Pattersonale, 55936.....	Pixie 4th, Vol. 15.....	Rubin, 15420.....	.....	.....
Lord Kirkclivington.....	Tea Rose 5th.....	3d Knight of Camb's, 26091.....	.....	.....
Mazurka King, 42233.....	Louan Airdrie 2d.....	Gem Airdrie 2d, 46118.....	Second.....	15 00
Duke of Oak Hill, 32552.....	Matilda 9th.....	Washington Airdrie, 13110.....	Third.....	8 00
Baron Wiley 2d, 49943.....	Lady Mary 3d.....	Duke Renick, 38542.....	.....	.....
Col. Judy, 47694.....	Juliet.....	Cloud, 16500.....	.....	.....
Col. Judy, 47694.....	Nellie.....	Tippecanoe, 34004.....	.....	.....
Imp. Antiquary, 49774.....	Fanny Airdrie 2d.....	Imp. D. of Richm'd, 21525.....	Second.....	8 00
Earl of Bourbon, 59371.....	Daisy of Patterson'de.....	3d D. of Newham, 35210.....	.....	.....
Earl of Bourbon, 59371.....	Joli Nell.....	Equinox, 26531.....	.....	.....
Earl of Bourbon, 59371.....	Effie Dean, Vol. 26.....	Lector Black, 50767.....	.....	.....
Aclam Sharon 3d.....	Profitable 1st.....	Duke of Clifton, 34218.....	.....	.....
Young Rocket, 54416.....	Belle of Walnut 5th.....	Mazurka Judge, 33526.....	.....	.....
" " ".....	Louan Airdrie 2d.....	Gem Airdrie 2d, 46118.....	Third.....	5 00
Oxford Lad 2d, 53062.....	Linda 14th, Vol. 24.....	Jupiter.....	.....	.....
Bessie's Duke.....	Minnie Springdale 2d.....	Springdale Airdrie, 37035.....	First.....	10 00
" " ".....	Jennie May 2d.....	2d Gem Duke of Airdrie.....	.....	.....
" " ".....	Sallie Bell 8th.....	Darter, 7806.....	.....	.....
16th Duke Sycamore, 51349.....	Louan Florence 15th.....	Imperial, 1124.....	.....	.....
Baron Booth of W'd'l'n, 25573.....	Red Rose.....	Sucker Boy, 9171.....	.....	.....
Tippecanoe, 34004.....	Juliet.....	Cloud, 16505.....	.....	.....
Magnolia's Maz. Duke, 52589.....	Kitty.....	Modoc.....	.....	.....
Plumwood F., 24318.....	Nannie Williams 5th.....	Duncan's Gen. Grant, 856.....	.....	.....
Earl of Forestdale, 23029.....	Moselle.....	Pope, 7113.....	.....	.....
Col. Redman, 25972.....	Profitable 13th.....	4th Duke of Onelda, 13727.....	First.....	35 00
Cannon Ball, 22305.....	Superior 6th.....	Sucker Boy, 9171.....	Second.....	20 00
3d Duke of Onelda, 11798.....	".....	".....	.....	.....
Washington Airdrie, 13110.....	Mate.....	Airdrie 2d, 11267.....	Third.....	10 00
Springdale Airdrie 2d.....	May Flower.....	Washington Airdrie, 13110.....	.....	.....
Tippecanoe, 34004.....	Juliet.....	Cloud, 16500.....	Third.....	10 00
Plumwood M. M., 33470.....	Pixie 4th.....	Rubin, 15420.....	.....	.....
Duke of Clifton.....	Profitable 16th.....	Col. Redman, 25972.....	First.....	35 00
2d Gem D. of Airdrie, 17140.....	Mamie Sprindale.....	Spring'de Airdrie 2d, 37035.....	Second.....	20 00

CATTLE.—SHORTHORNS—Continued.

Owner.	Postoffice.	Name and number of animal.
<i>Cow 2 years and under 3.</i>		
J. O. Edwards & Sons	Youngstown	Ella Moore 7th
same	"	Princes Airdrie 3d
Peter Boehm	Columbus	Lady Sharon
same	"	Magnolia's Viola
Geo. Watson & Son	South Charleston	Olympia D. Vol. 26
same	"	Jessie 5th, Vol. 26
C. C. Walker & Son	New Madison	Maryflower 6th
Geo. H. German	Franklin, Michigan	Lizzie 7th
D. D. Richards	Newark	Lulu 2d
same	"	Mamie Sharon 2d
N. S. Olin & Sons	Streetsboro	Miss Hathaway
Jas. R. Anderson & Sons	Anderson	Jennie Howell 2d
J. M. Black	Hanover	Gwynne of Hanover
same	"	Juliette
<i>Heifer 1 year and under 2.</i>		
J. O. Edwards & Sons	Youngstown	Red Fancy 4th
C. C. Walker & Son	New Madison	Profitable 1st
Geo. H. German	Franklin, Michigan	Rosy
same	"	Lizzie 8th
D. D. Richards	Newark	Belle of Walnut 7th
N. S. Olin & Sons	Streetsboro	Oneida Lass
Jas. R. Anderson & Sons	Anderson	Morine
<i>Heifer calf.</i>		
D. W. Brown	Tiffin	Tulp
same	"	Lullie
Jas. T. Miller	Marble Cliff	Little Jessie of Marble Cliff
Geo. T. Watson & Son	South Charleston	Mollie C
same	"	Yorkshire 5th
C. C. Walker & Son	New Madison	Profitable 2d
same	"	Red Rose
Geo. H. German	Franklin, Michigan	Alma Countess of the Valley
B. D. Richards	Newark	Maid of R. V.
same	"	Duchess of Mt. Zion
N. S. Olin & Son	Streetsboro	

DEVONS.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 3 years and over.</i>		
S. J. Wooley	Hilliard	Hartland, 1510
D. J. Whitmore & Co.	Casstown	Champion, 883
R. K. Payne	Parkman	King William 2d, 2170
Irvin York	Brock	Baily 2d, 2070
Rumsey Bros	Westfield, N. Y	Marquis 2d
J. W. Pollock	Cedarville	Charles Elliott
<i>Bull 2 years and under 3.</i>		
D. J. Whitmore & Co.	Casstown	Era, 2964
Irvin York	Brock	Bruck Boy, 2581
Rumsey Bros	Westfield, N. Y	General Windham 2d, 3419
J. W. Pollock	Cedarville	Charlie Foster

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Washington Airdrie, 13110...	Ella Moore 7th.....	Lord Dunmore, 23726.....	Third	\$10 00
" " "	Princess Azarine	Prince John, 12663	Second .	15 00
Scioto Sharon	Crumley Vail'y Lass 3d	St. Clair, 27822
Magnolia's Maz. Duke, 25589	Viola	Starlight 2d, 2259
Dooter Black, 50767	Olympia	Rubin, 15420
" " "	Jessie	Clifton Duke 4th, 13666.....
Hudson D. of Sideview, 29414	Mayflower 8th	Springdale Airdrie, 37035....
Mariner 5th, 20336	Lizzie 6th	German's Lord Barrington
Duke of Ross, Vol. 20	Lulu	Spring'le Airdrie 2d, 27035
Airdrie Renick, 42712	Mamie Sharon	Spring'le Airdrie 2d, 37035	First	25 00
Col. Acornb 2d, 37954	Daisy Booth	Imp. F. B. of Lanc'r, 7535
Hudson Duke of Sideview... ..	Sallie Belle 8th	Dexter, 7896
16th Waverly Duke, 54264	Oxford Gwynne	Earl of Oxford, 8072
Mazurka King, 42283	Julia Princess	Prince of Mariss, 5672
Washington Airdrie, 16110..	Red Fancy	Fancy's Airdrie, 51569.....	First	29 00
General Garfield, 38968	Profitable 16th	Col. Redman, 27972
Llewellyn, 6953	Red Rose	German's Lord Barrington
Mariner 5th, 20336	Lizzie 6th	German's Lord Barrington
Waterloo of R., 42255	Belle of Walnut 5th.....	Mazurk Judge, 33256	Third ...	8 00
Oakland Duke, 33353	Lady Ruth	3d Duke of Onelda	Second .	12 00
Springdale Airdrie 2d	Mayflower 2d	Lord Dunmore, 5405
Tippicanoe, 34004	Tippicanoe Rose	Baron Booth of W'n, 25593	Third ...	5 00
Col. Judy, 47694	Sadie	Tippicanoe, 34004
" " "	Mollie B	Dick Gano, 2962L
Earl of Bourbon, 59671	Yorkshire	Equinox, 26531
Aclam Sharon 3d	Profitable 16th	Col. Redman, 25972	Second .	8 00
" " "	Greenwood Louan 47th	Loudon Duke of G'd, 24261	First	10 00
Young Rocket, 54116.....	Alma Countess 4th.....	B'n Maz.'s Hubback, 6747.....
" " "	Minnie's Gem	2d Gen D. of Airdrie, 17144
2d Duke of Mt. Zion, 2903.....	Lady Ruth	3d Duke of Onelda

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Lord Nelson, 800.....	Fancy, 1222			
Batavia, 281	Beauty, 583	Prince Albert, 972		
King William, 769	Empress 2d	Baronet, 2162.....	First	\$30 00
Baily, 275	Minnie, 2050			
Marquis, 1707.....	Nellie, 6312.....		Second	15 00
.....				
Frank, 1562	Rosa McPherson, 8158.	Guelph Chief, 640.....		
Champion, 382	Bessie, 672.....		First	30 00
Gen. Windham, 3400	Nellie, 6313.....		Second	15 00
Cole's Perfection, 1369	Narcissus, 3889	Barister, 281		

CATTLE.—DEVONS—Continued.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 1 year and under 2.</i>		
D. J. Whitmore & Co.....	Casstown	Bremen, 3001
Irvin York.....	Brock.....	Guelf, 3244
J. W. Pollock	Cedarville	John Hardy, 2767
<i>Bull calf.</i>		
S. J. Wooley	Hilliard	Vashti, 3254
same	"	Seminole, 3452
D. J. Whitmore & Co.....	Casstown	Bernadott, 3253
Irvin York.....	Brock.....	Surrey
Rumsey Bros	Westfield, N. Y.	
<i>Cow 3 years and over.</i>		
S. J. Wooley	Hilliard	Buckeye Belle, 2869
same	"	Queen of Applsby, 4624
D. J. Whitmore & Co.....	Casstown	Kitty Clover, 1684
same	"	Pink Waterloo, 4466
R. K. Payne.....	Parkman	Bertha Payne, 4484
same	"	Miss Juno, 4485
Irvin York.....	Brock	Bessie, 672
same	"	Dot, 3045
Rumsey Bros	Westfield, N. Y.	Lady Eliza
same	"	Blossom
J. W. Pollock	Cedarville	Luna 2d
<i>Cow or heifer 2 years and under 3.</i>		
D. J. Whitmore & Co.....	Casstown.....	Gervase, 4684
R. K. Payne.....	Parkman.....	Arda, 4199
Irvin York.....	Brock.....	Laura M., 5200
Rumsey Bros	Westfield, N. Y.	Snow Drop
same	"	Minnie
J. W. Pollock	Cedarville	Belle Logan
<i>Heifer 1 year and under 3.</i>		
D. J. Whitmore & Co.....	Casstown.....	Bessie Allen
R. K. Payne.....	Parkman	Sitter, 5721
Irvin York.....	Brock	Settle, 6064
Rumsey Bros	Westfield, N. Y.	Dinah
<i>Heifer calf.</i>		
S. J. Wooley	Hilliard	Waussa, 6077
same	"	Bonefile, 6081
D. J. Whitmore & Co.....	Casstown	Clara Ryan, 6292
Irvin York.....	Brock.....	Mardi, 6065
same	"	Moss
Rumsey Bros	Westfield, N. Y.	

HEREFORDS.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 2 years and over.</i>		
G. S. Cloyd	Ithaca	Hero, 5352
F. H. Johnson & Co.....	South Bend, Ind.....	Dakota, 6298

CATTLE.—DEVONS—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Col. Ryan, 410	Rose Bud	Prince Arthur, 980.....	First	\$15 00
Right Trusty, 2316	Maud Mores, 4406.....	.....	.....	.....
Berry, 2497.....	Cherry 3d, 826.....	Dan Baker, 444	Second .	8 00
Barefoot, 732	Buckeye Belle, 2869.....	.....	First	10 00
Barefoot, 732	Queen Bessie, 2868.....	.....	.....	.....
Prince of Lapeer, 1581.....	Effie, 3194.....	Butler, 357	Second .	5 00
Baily 2d, 2070.....	Bessie, 672 .....	.....	.....	.....
Baron, 278	Cherry 3d, 826.....	.....	.....	.....
Frank, 1333	Buckeye Belle, 2869.....	.....	.....	.....
Bounty, 334.....	Pink, 2242.....	Bounty, 334.....	.....	.....
Col. Ryan, 410.....	Pink 3d, 3545.....	Duke Alexis, 482	Second .	15 00
Cyrus, 1860.....	Jennie, 3731	Beverly, 446.....	First	30 00
Cyrus, 1860.....	Frances, 3732.....	May Boy, 1859	Second .	5 00
Baily, 275	Bome, 672 .....	.....	.....	.....
Champion, 383	Bessie, 672 .....	.....	.....	.....
Hartland, 865	Maggy, 1923 .....	.....	.....	.....
Dandy, 447.....	Miss Ann, 2066.....	.....	.....	.....
Barister, 281	Belle Patterson, 658	Jack, 721 .....	.....	.....
Barefoot, 272	Kitty Clover, 1684	Bounty, 334.....	Second .	15 00
Cyrus, 1860.....	May Queen, 3600.....	Bouncer, 333	First	30 00
Frank P., 2078	Daisy, 955	Tom, 1180 .....	.....	.....
Breastwork, 1294	Agnes 4th, 2861	Dan. Baker, 444.....	.....	.....
Duke of Coldwater, 2654.....	Lovely Allen, 5145.....	Orphan Boy, 925.....	.....	.....
King William 2d, 2170.....	May Queen, 3600.....	Bouncer, 333.....	First	15 00
Baily 2d, 2070.....	Mayflower Daisy, 4405.....	.....	Second .	8 00
Barefoot, 782	Little Bettie, 4496.....	.....	.....	.....
Barefoot, 732	Queen of Appledale.....	.....	.....	.....
Col. Ryan, 410.....	Clara Keokuk, 4460.....	Sampson, 1099.....	.....	.....
Baily 2d, 2070.....	Carrie, 767 .....	.....	First	10 00
Baily 2d, 2070.....	Maggie Moses, 4403.....	.....	Second .	5 00

HEREFORDS.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Regulus, 3249.....	Spot, 3347.....	Horace 2d, 4353	First	\$30 00
Tredigar, 338	Dolly Varden, 1125.....	Sir Charles, 548.....	Second .	15 00

CATTLE.—HEREFORDS—Continued.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 2 years and under 3.</i>		
F. H. Johnson & Co	South Bend, Ind.....	Century, 6839.....
G. W. Millikin	Youngstown	Leotard, 15576.....
<i>Bull 1 year and under 2.</i>		
G. W. Millikin.....	Youngstown	Jim Blaine.....
<i>Bull calf.</i>		
F. H. Johnson & Co.....	South Bend, Ind.....	Frank H.....
G. W. Millikin	Youngstown	Fair Boy.....
<i>Cow 3 years and over.</i>		
G. S. Cloyd.....	Ithaca	Lillian 2d, 11756.....
F. H. Johnson & Co.....	South Bend, Ind.....	Dauntton Red Rose, 11009
same	"	Stately Maid, 12186
G. W. Millikin	Youngstown	Vulture, 17893.....
<i>Cow 2 years and under 3.</i>		
G. W. Millikin	Youngstown	Jessamine
same	"	Easter 2d.....
<i>Heifer 1 year and under 2.</i>		
G. W. Millikin	Youngstown	Mabel, 17414
F. H. Johnson & Co	South Bend, Ind.....	Spot 6th.....
<i>Heifer calf.</i>		
F. H. Johnson & Co	South Bend, Ind.....	White Pigeon, 13149.....
G. W. Millikin	Youngstown	Lady, 17415
same	"	Lott, 17416

JERSEYS.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 3 years and over.</i>		
Parsons & Black.....	Worthington.....	Gray King, 5219
John J. Maxon	Gallipolis.....	Palmer's Pitt, 8636
F. H. Johnson & Co	South Bend, Ind.....	Duke of Willow Grove, 4813.....
Isaac Riegel.....	Cedar Hill.....	Hebe's Butter Stamp, 6852.....
T. B. Van Horne & Co.....	Columbus	Pierrot's Best Son.....
W. S. Mussleman.....	Bellefontaine	Lee of Mt. Waite, 7711
<i>Bull 2 years and under 3.</i>		
Parsons & Black.....	Worthington.....	Rex of Jersey, 12878
F. H. Johnson & Co.....	South Bend, Ind	Alexis Iron Bank, 9813.....
Isaac Riegel.....	Cedar Hill	Butter Worker, 12601.....
G. M. Hoover, Manager.....	Urbana	Prince Victor, 11928
T. B. Van Horne & Co	Columbus	Stake Poker Prince.....

CATTLE.—HEREFORDS—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Irvington Wilton, 4056.....	Cora, 3884	Sir Richard 2d, 970	Second.	\$15 00
Rudolph, 13478	Laura 3d, 15577.....	Commander, 4452.....	First	30 00
Traddles.....	Pinky 5th, 15573.....	Sampson, 15568	First	15 00
Dakota, 6298.....	Cheerless, 13450.....	Zulu Chief, 6773.....	Second.	5 00
Leotard, 15576	Eva S., 5880	Gay Lad, 4232	First	10 00
Treasurer Trove, 8236.....	Lillian	Regulus, 3849 .....	.....	.....
Dauntton Boy, 5877.....	Cornelia 2d	Severns 2d, 3195.....	Second.	10 00
"	Stately Maid 5th	Dauphin	First	30 00
Silver Stone, 12239	Jovial, 14583	Butler, 5784.....	.....	.....
Rosearian, 7870.....	Victoria, 13627.....	Highminster, 6184.....	First	30 00
Bonnie Lad	Easter.....	Sir Richard 2d.....	Second.	15 00
Centennial, 1530	Eva S., 5880	Gay Lad. 4232.....	Second.	8 00
.....	.....	.....	First	15 00
Dakota, 6298.....	Dauntton R. Rose, 11009	Dauntton Boy, 4434	Second.	5 00
Leotard, 15576	Jessamine, 15582.....	Silver Stone, 12239 .....	.....	.....
Centennial, 1530.....	Easter 2d.....	Bonnie Lad.....	First	10 00

JERSEYS.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Padisha, 1676.....	Ravenna, 2114	Rival, 1011.....	.....	.....
Sitting Bull, 2396	Robert R., 5400 .....	.....	.....	.....
Grand Duke Alexis, 1040.....	Clytemnestra 2d, 5868.....	Wm. Hudson, 905	First	\$30 00
Butter Stamp, 700	Countess Hebe, 8102.....	Antelope, 1927 .....	.....	.....
Glue, 3960	Mabel Lee, 7982.....	Sweepstakes Duke, 1905.....	Second.	15 00
Lemon Rex, 5458.....	Annie Gray, 11712.....	.....	.....	.....
Duke of Willow Grove, 4813	Picciola of Leb'n, 6596.....	Iron Bank, 1120.....	Second.	15 00
Hebe's Butter Stamp, 6852	Bessie Walker, 13198.....	Niantic, 5244 .....	.....	.....
Prince Ernest, 11627	Kitty of St. L'mb't, 6637	Stake Poger 3d, 2258.....	First	30 00

CATTLE.—JERSEYS—Continued.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 1 year and under 2.</i>		
Parsons & Black.....	Worthington.....	Rayon D'Or's Best Son, 14139.....
F. H. Johnson & Co.....	South Bend, Ind.....	Mareffe's Duke, 14123.....
Ohio State University.....	Columbus.....	Ernest Rex.....
E. W. Pegg.....	Clintonville.....	Cidriclouis, 12401.....
Isaac Riegel.....	Cedar Hill.....	Junior.....
G. M. Hoover, Manager.....	Urbana.....	Duke du Coin.....
<i>Bull calf.</i>		
Parsons & Black.....	Worthington.....	Paul Jones.....
F. H. Johnson & Co.....	South Bend, Ind.....	Roger Clay.....
Ohio State University.....	Columbus.....	
Isaac Riegel.....	Cedar Hill.....	
G. M. Hoover, Manager.....	Urbana.....	
T. B. Van Horne & Co.....	Columbus.....	
<i>Cow 3 years and over.</i>		
Parsons & Black.....	Worthington.....	Annie Gray 2d, 11712 (imported).....
same.....	same.....	Katie Miller 2d, 10191.....
F. H. Johnson & Co.....	South Bend, Ind.....	Little Patience, 18250.....
same.....	same.....	Mareffe, 15044.....
Ohio State University.....	Columbus.....	Virgie Lyle, 5698.....
same.....	same.....	Lady Lyle, 9498.....
same.....	same.....	Clara Lyle, 10791.....
same.....	same.....	Lady Bacon 2d, 10790.....
same.....	same.....	Rose Page 2d, 21733.....
G. M. Hoover, Manager.....	Urbana.....	Pennsylvania.....
same.....	same.....	O'Bella B., 10575.....
same.....	same.....	Wildred, 11834.....
<i>Cow 2 years and under 3.</i>		
Parsons & Black.....	Worthington.....	Pansies' Commassie, 25833.....
F. H. Johnson & Co.....	South Bend, Ind.....	Excelma, 24268.....
G. M. Hoover, Manager.....	Urbana.....	Lister Cash.....
T. B. Van Horne & Co.....	Columbus.....	Bargene.....
<i>Heifer 1 year and under 2.</i>		
Parsons & Black.....	Worthington.....	Katie's Commassie, 24135.....
same.....	same.....	Luna May.....
F. H. Johnson & Co.....	South Bend, Ind.....	Forest Lula, 28996.....
Ohio State University.....	Columbus.....	Etta Bacon.....
Isaac Riegel.....	Cedar Hill.....	Bliss Burley, 23558.....
G. M. Hoover, Manager.....	Urbana.....	Comask.....
<i>Heifer calf.</i>		
Parsons & Black.....	Worthington.....	Ianthe Dean.....
same.....	same.....	Pansies' Silvia.....
Ohio State University.....	Columbus.....	Hilda.....
same.....	same.....	Annie Page.....
same.....	same.....	Laura Lyle.....
same.....	same.....	Myrtle Lyle.....
same.....	same.....	Maud Lyle.....
same.....	same.....	Mabel Lyle.....
same.....	same.....	Zella Lyle.....
Isaac Riegel.....	Cedar Hill.....	
same.....	same.....	
G. M. Hoover, Manager.....	Urbana.....	
F. B. Van Horne & Co.....	Columbus.....	
Parsons & Black.....	Worthington.....	Capitola.....

CATTLE.—JERSEYS—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Rayon D'Or, 7516.....	C'o'r Bloss's Niece, 19959			
Duke of Willow Grove, 4813	Marefle, 15044.....	Margertie, 2642.....	Second.	\$8 00
Lemon Rex	Clara Lyle, 10791.....	Thorndale, 2582.....		
Cidric, 4828.....	Reliance, 17193.....	Knight of St. Louis, 3680.....	First.....	15 00
Hebe's Butter Stamp, 6852.....	Bessie Walker, 13198.....	Niantic, 5244.....		
Nero du Coin	Duch. St. Pierre, 23478.....	Bergin, 278.....		
Gray King, 5219.....	Double Rex Pansy, 4045	Easter Boy, 3032.....		
Cephalus, 9870.....	Rose of L'e Forest, 5011	Phenomenon, 1147.....		
Hebe's Butter Stamp, 6852.....	Bessie Walker, 13198.....	Niantic, 5244.....	First.....	10 00
Cash Boy, 2248.....	Wildred, 11834.....	Charlie Kittridge, 1247.....	Second.	5 00
Pierrot 7th, 1667.....	Kittie Miller, 4140.....	Pierrot (Imp.).....		
Whip 2d, 5435.....	Vivalia, 12760.....	Nutshell, Jr., 1500.....	First.....	30 00
Margertie, 2642.....	Effie Hudson, 2516.....	R. S. Hill, 1480.....	Second.	15 00
Thornton, 1661.....	Aliena 4714.....	Thornton, 1661.....		
Thorndale, 2582.....	Virgie Lyle, 5698.....	Targuin, 750.....		
Henry Clay, 4421.....	Lady Bacon, 7040.....	Son of Rosa, 663.....		
Forget-Me-Not, 291.....	Rosa Page, 4009.....	Romulus, 186.....		
Coronus, 3197.....	Rosy, 411.....	Nutshell, 729.....		
Charlie Kittridge, 1247.....	O'Bella, 5080.....			
	Cow's p of O., Imp., 2593			
Lemon Rex, 5428.....	Double Rex Pansy, 4645	Easter Boy, 3032.....		
Duke of Willow Grove, 4813	Hebe Ross, 8821.....	Tom, F. S., 72.....		
Cash Boy.....	Little Sister, 11666.....	Pierrot 2d, 1669.....	Second.	15 00
			First.....	30 00
Rayon D'Or.....	Commassie (Imp.).....	Clifton Monarch, 3546.....	Second.	8 00
Duke of Olentangy, 4148.....	Annie Dean, 20346.....	Phenomenon, 1147.....		
Duke of Willow Grove, 4813.	Rose of L'e Forest, 5011	Targuin, 750.....		
Henry Clay, 4421.....	Lady Bacon, 7040.....	Charlie Kittridge, 1247.....		
Cash Boy, 2248.....	Burley, 11838.....	King Horn, 3280.....	First.....	15 00
Combination, 4389.....	Damask Law'ce, 14850.....			
Rex of Jersey, 12878.....	Annie Dean, 20346.....	Clifton Monarch, 3546.....		
"	"	"	First.....	10 00
Hebe's Butter Stamp, 6852.....	Bless Burley, 23558.....	Cash Boy, 2248.....	Second.	5 00
"	Nellie Booth, 12532.....	Rex Alpher, 4508.....		
Easter Boy, 3032.....	Pennsylvania, 23477.....	Forget-Me-Not, 129.....		

CATTLE.—HOLSTEINS.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 3 years and over.</i>		
J. B. Gibbs	Cleveland	Ichabod Crane, 1465
M. R. Seeley & Co.	North Farmington, Mich	Ykema, 322
F. C. Stevens	Attica, N. Y.	Constantyn, 2040
Thos. Yates & Son	Delaware	Onelda, 315
French Bros	Cincinnati	International Prince, 252
same	"	Jelle, 202
Jas. L. Henderson	Washington, Pa	McKean, 2611
J. W. Stillwell & Co	Troy	Jacob, 608
same	"	Prince of Tuisk
<i>Bull 2 years and under 3.</i>		
F. C. Stevens	Attica, N. Y.	Prince of Oakwood
Thos. Yates & Son	Delaware	Sir Archie, 2298
Jas. L. Henderson	Washington, Pa	Cornells
J. W. Stillwell & Co	Troy	Promoter 2d, 2004
same	"	Jacobus 2d, 2195
<i>Bull 1 year and under 2.</i>		
M. R. Seeley & Co	North Farmington, Mich	Ykema 3d
F. C. Stevens	Attica, N. Y.	Sir Henry of Maplewood, 2933
Thos. Yates & Son	Delaware	Allison, 3904
French Bros	Cincinnati	(Imported)
J. W. Stillwell & Co	Troy	Government
F. C. Stevens	Attica, N. Y.	Prince of Oakwood
<i>Bull calf.</i>		
M. R. Seeley & Co	North Farmington, Mich	Ykema 3d
F. C. Stevens	Attica, N. Y.	Prince Raaid, 33
same	"	Rigel, 27
Thos. Yates & Son	Delaware	Prince Solon
Jas. L. Henderson	Washington, Pa	"
J. W. Stillwell & Co	Troy	"
same	"	"
same	"	"
<i>Cow 3 years and over.</i>		
M. R. Seeley & Co	North Farmington, Mich	St. Anna, 372
F. C. Stevens	Attica, N. Y.	Jewel, 668 (imported)
same	"	Rhoda, 434
same	"	Zuinere, 8354
same	"	Omlote, 8551 (imported)
same	"	Lutscke, 8356 (imported)
Thos. Yates & Son	Delaware	Vriend, 2439 (imported)
same	"	Widow Bedott, 998 (imported)
French Bros	Cincinnati	Lady Philpail (imported)
same	"	Klazisntji (10396) imported
same	"	Mora of Ostfield, 10399
J. L. Henderson	Washington, Pa	Gustina, 206 (imported)
same	"	Betje, 730 (imported)
J. W. Stillwell & Co	Troy	Pride of Tuisk (imported)
same	"	Deovies, 5433 (imported)
same	"	Castine, 3796 (imported)
<i>Cow or heifer 2 years and under 3.</i>		
M. R. Seeley & Co	North Farmington, Mich	Huisumen, 957
F. C. Stevens	Attica, N. Y.	Ofinga, 4057 (imported)
same	"	Tirannia, 6716
same	"	Echo S., 2320
Thos. Yates & Son	Delaware	Lady Mac, 2980
French Bros	Cincinnati	Jodine, 10403
same	"	Philpail 2d, 10406
James L. Henderson	Washington, Pa	Zazel, 5027
same	"	Volleurr 2d, 3794
J. W. Stillwell & Co	Troy	Meitje Hartow, 6434
same	"	Yeagev Key, 7619

CATTLE.—HOLSTEINS—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
De Graaf, 166.....	Trijtje, 370.....	.....	.....	.....
De Pylander, 105.....	Zuarta Ykema, 569 ....	.....	.....	.....
Constantyn, 157.....	Betje, 643.....	.....	First.....	\$30 00
Siegel, 154.....	Lady Young, 767.....	.....	Second..	15 00
Cesar, 88.....	.....	.....	.....	.....
Groote Pier, 48.....	De Nette, 317.....	.....	.....	.....
District Bull of Beemsted..	Neusje.....	Bred in Holland .....	.....	.....
Imported in dam.....	Mercedes, 723.....	.....	.....	.....
.....	Pride of Tuisk, 723....	.....	.....	.....
Damon.....	Arladue.....	Mahomet.....	.....	.....
Oneida, 305.....	Virend, 2439.....	.....	Second..	15 00
Bred in Holland.....	.....	.....	.....	.....
Promoter, 1518.....	Girtje 2d, 1528.....	.....	First.....	30 00
Johannis, 482.....	Young Jacoba, 688 ....	.....	.....	.....
Ykema, 322.....	Jantje Postma, 977.....	.....	Second..	8 00
Hallerman, 866.....	Ononis, 2366.....	Empire, 588.....	First.....	15 00
Oneida, 305.....	Alada, 2410.....	.....	.....	.....
Jacob 4th, 210.....	Bless, 4103.....	.....	.....	.....
Clarion, 870.....	Garter, 662.....	.....	.....	.....
Ykema, 322.....	K'ma Antje 12th, 959...	.....	.....	.....
Constantyn, 2040.....	Jluval 2d, 1119.....	Ebbo, 236.....	First.....	10 00
Cyrus, 2041.....	Cresca, 5791.....	.....	.....	.....
Oneida, 305.....	Alada, 2410.....	.....	.....	.....
McKean, 2611.....	Pynhn, 7111.....	Bred in Holland	Second..	5 00
Jacob, 608.....	Katie K., 5466.....	.....	.....	.....
Jacob, 608.....	Rusti Gates, 5460.....	.....	.....	.....
Jacob, 608.....	Lizzie F., 5470.....	.....	.....	.....
Roland, 144.....	Foxelar 8th, 55.....	Zuider Zee 2d, 57.....	First.....	30 00
.....	.....	.....	Second..	15 00
Nicholas, 184.....	Maatje, 836.....	.....	.....	.....
Jacob 4th, 210.....	.....	.....	First.....	30 00
Abbedirk, 206.....	.....	.....	.....	.....
Bless, 432.....	Thelia 5th, 2979.....	Bless, 433.....	Second..	15 00
Imported.....	Imported.....	.....	.....	.....
District Bull of Guesthinsen	Lady Philpail, 10394.....	.....	.....	.....
Lenox, 407.....	Louisa.....	Bred in Holland .....	.....	.....
.....	Velleurr.....	.....	.....	.....

CATTLE.—HOLSTEINS—Continued.

Owner.	Postoffice.	Name and number of animal.
<i>Heifer 1 year and under 2.</i>		
M. R. Seeley & Co.....	North Farmington, Mich	Maid of Spring Brook
F. C. Stevens.....	Attica, N. Y.....	Lady Echo, 5783
same	"	Hollander 2d, 5782
French Bros.....	Cincinnati.....	Philpall 3d
same	"	Pearla, 10413
same	"	Fair Kate, 10414
same	"	Durkje 5th of Ohio, 10411
Jas. L. Henderson.....	Washington, Pa	Betje, 6187.....
J. W. Stillwell & Co.....	Troy	Kentucky Gem, 6490.....
same	"	Mettea, 9702.....
same	"	Neresis
<i>Heifer calf.</i>		
M. R. Seeley & Co.....	North Farmington, Mich	Helzumer 2d.....
F. C. Stevens.....	Attica, N. Y	Rhoda 3d.....
same	"	Vinnie 3d.....
Thos. Yates & Son.....	Delaware	Supercillious, 307
French Bros.....	Cincinnati.....	
J. L. Henderson.....	Washington, Pa	Netherland Lady.....
J. W. Stillwell & Co.....	Troy	Mattie
same	"	
same	"	

ANGUS AND GALLOWAYS, OR ANY OTHER PURE POLLED BREEDS NOT IN OTHER CLASSES.

Owner.	Postoffice.	Name and number of animal.
<i>Bull 3 years and over.</i>		
J. McLain Smith	Dayton	Duke of Dayton, 662
Benton Garinger	Washington C. H.....	Paris 4th
<i>Bull 2 years and under 3.</i>		
Benton Garinger.....	Washington C. H.....	Buffalo Bill.....
<i>Bull calf.</i>		
J. McLain Smith	Dayton	Bachelor
Benton Garinger	Washington C. H.....	Cleveland
<i>Cow 3 years and over.</i>		
J. McLain Smith	Dayton	Ruby Rose, 1830.....
Benton Garinger.....	Washington C. H.....	Edith
same	"	Moss Rose.....
<i>Cow 2 years and under 3.</i>		
J. McLain Smith	Dayton.....	Lady Blanche
same	"	Beauty 5th.....
Benton Garinger	Washington C. H.....	Black Beauty.....
same	"	Bonnie Dam.....

CATTLE.—HOLSTINS—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Ykema, 322.....	De Gaeri's Wopkje, 964.....	Mahomet.....		
De Toustic Steer, 1281.....	Echo 2d, 1355.....			
Constantyn, 2040.....	Hollander, 843.....			
Nicholas, 567.....	Lady Philpail, 10394.....			
Garfield, 257.....				
	Durkje 3d, 845.....			
De Hoop, 311.....	Bette, 730.....		Second..	\$8 00
Jaap, 452.....	Antrim 2d, 246.....			
St. Elmo, 714.....	Sadie F., 5398.....		First...	15 00
Jacob, 608.....	Pekush.....			
Constantyn, 2040.....				
Ykema, 322.....	Huizumer, 957.....			
Constantyn, 2040.....	Rhoda, 434.....	Roland.....		
Constantyn, 2040.....	Vinnie.....		First.....	10 00
Harold of Shadeland, 1499.....	Uriend.....			
Nicholas, 567.....	Mass Nymph, 10401.....			
Netherland Baron.....	Zagul, 5027.....			
			Second..	5 00

ANGUS AND GALLOWAYS, OR ANY OTHER PURE POLLED BREEDS NOT IN OTHER CLASSES.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Champion, 271.....	Rebecca, 1772.....	Ravenswood Beau, 150.....	First.....	\$15 00
			First.....	15 70
			First.....	30 00
Francelle, 669.....	Tillie, 1893.....	Champion, 271.....	First.....	5 00
			First.....	5 00
Gray Spot, 498.....	Rose 5th, 1146.....	Norfolk Duke, 127.....	First.....	15 00
			First.....	15 00
Mason, 698.....	Sophia, 2542.....	Cyprus, 473.....		
Romeo, 741.....	Beauty 4th, 1310.....	Davyson 7th, 476.....	First.....	15 00
			First.....	15 00

**CATTLE.—ANGUS AND GALLOWAYS, OR AND OTHER PURE POLED BREEDS NOT
IN OTHER CLASSES—Continued.**

Owner.	Postoffice.	Name and number of sire.
		<i>Heifer 1 year and under 2.</i>
J. McLain Smith	Dayton	Cora
same	"	Lulu
Benton Garinger	Washington C. H.	Rosa
		<i>Heifer calf.</i>
Benton Garinger	Dayton	

AYRSHIRES.

Owner.	Postoffice.	Name and number of sire.
		<i>Bull 3 years and over.</i>
Fairweather & Mason	McLane, Pa.	Premier, 2321
Henry Betts	Wellington	Blanche Burns' Lad, 2824
T. E. Wight	Millbury	Syndicate
		<i>Bull 2 years and under 3.</i>
Fairweather & Mason	McLane, Pa.	Clunie, 3551
Henry Betts	Wellington	Jacob Henry, 3530
		<i>Bull 1 year and under 2.</i>
Fairweather & Mason	McLane, Pa.	Lundie
Henry Betts	Wellington	Whit
T. E. Wight	Millbury	Lake
		<i>Bull calf.</i>
Fairweather & Mason	McLane, Pa.	Gairly
Henry Betts	Wellington	Scott Burns, 3481
T. E. Wight	Millbury	Troy
		<i>Cow 3 years and over.</i>
Fairweather & Mason	McLane, Pa.	Goldena, 4628
same	"	Lucia, 5799
same	"	Eunle, 6449
Henry Betts	Wellington	Blanche Burns, 4324
same	"	Bright Eyes, 6059
same	"	Lily Hudson, 6058
same	"	Blanche Burns 2d, 5779
T. E. Wight	Millbury	Nannette, 3707
same	"	Lucy of Wood, 8045
same	"	Iza
		<i>Cow 2 years and under 3.</i>
Fairweather & Mason	McLane, Pa.	Carrie 2d, 7495
Henry Betts	Wellington	Staly Lady, 7278
same	"	Miss Cassels 2d
T. E. Wight	Millbury	Gusta Belle

**CATTLE.—ANGUS AND GALLOWAYS, OR ANY OTHER PURE POLED BREEDS NOT
IN OTHER CLASSES—Continued.**

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Mason, 695.....	Rosalla, 1786.....	Champion, 371.....	First.....	\$7 50
".....	Lida, 1620.....	".....	First.....	7 50
".....	".....	".....	First.....	10 00

In the above class red and black polled cattle coming into competition, the amount offered was divided and first premiums awarded to each.

AYESHIRE.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Kilmarnock, 1245.....	Princess Belle, 3741.....	Jack 2d, 1217.....	First.....	\$30 00
Lily's Lad, 2149.....	Blanche Burns, 4924.....	Romak, 1699.....	Second.....	15 00
Premier, 2321.....	Zalance, 5118.....	Dundee, 1111.....	Second.....	15 00
Duke of Lorain, 2599.....	Bright Eyes, 6059.....	Linden Lad, 2498.....	First.....	30 00
Columbia Lad, 2695.....	Lady Starlight, 7277.....	Straven Callen, 2144.....	First.....	15 00
".....	".....	".....	Second.....	8 00
Premier, 2321.....	Harriet 4th, 5802.....	Lord Avondale, 1268.....	Second.....	5 00
Miss Liefer, 4082.....	Sir John.....	".....	First.....	10 00
Kilmarnock, 1245.....	Topsy 3d, 3277.....	Hickory, 614.....	".....	".....
Lord Douglas, 1283.....	Lady Essex 2d, 3594.....	Lord Avondale, 1268.....	".....	".....
Duke of Hamilton, 2354.....	Ayrshire Lass, 2011.....	Colly Hill in Scotland.....	".....	".....
Romak, 1699.....	Jessie Burns, 2571.....	Donald Blaine, 509.....	".....	".....
Linden Lad, 2498.....	Lady Miller, 6060.....	Lord Wallace, 1293.....	First.....	30 00
Sir Henry, 2828.....	Bright Eyes, 6059.....	Linden Lad, 2498.....	".....	".....
Lily's Lad, 2149.....	Blanche Burns, 4924.....	Romak, 1699.....	Second.....	15 00
Lorain, 681.....	Nannette, 3707.....	".....	".....	".....
Harold, 2046.....	Carrie, 5291.....	Lord Douglas, 1283.....	Second.....	15 00
John A., 3378.....	Lady Starlight, 7277.....	Straven Callen, 2144.....	First.....	30 00
Pittsfield Ben, 2174.....	Miss Cassels, 4687.....	".....	".....	".....
Syndicate.....	Nannette, 3707.....	".....	".....	".....

CATTLE.—AYRESHIRES—Continued.

Owner.	Postoffice.	Name and number of sire.
		<i>Heifer 1 year and under 2.</i>
Fairweather & Mason.....	McLane, Pa.....	Lucky Essex, 7699.....
same.....	“.....	Bright Fancy, 8256.....
Henry Betts.....	Wellington.....	Blanche Buras 3d, 8121.....
same.....	“.....	Carrie, 8123.....
		<i>Heifer calf.</i>
Fairweather & Mason.....	McLane, Pa.....	Puma Fair, 8258.....
same.....	“.....	Madie Yule, 8487.....
Henry Betts.....	Wellington.....	
same.....	“.....	

CATTLE.—AYRSHIRES—Continued.

Name and number of sire.	Name of dam.	Name and number of dam's sire.	Premium.	Amount.
Wm. Muir, 2793½	Lady Essex 2d, 3594	Lord Avondale, 1268	First	\$15 00
" "	Felicia, 5800	Red Butterfly, 2049		
Columbia Lad, 2695	Blanche Burns, 4924	Romak, 1699	Second	8 00
" "	Bright Eyes, 6059	Linden Lad, 2498		
Premier, 2321	Lizette, 7151	Waushakum, 1736		
" "	Sala, 7232	George, 1620½	Second	5 00
Columbia Lad, 2695	Dairy Maid of Lorain	Norbet, 1358		
Scott Burns, 3484	Statcly Lad, 7278	John A., 3378	First	10 00

SWEEPSTAKES ON BEEF BREEDS.

[To include all recognized beef breeds. For pedigrees, see classes.]

Owner's name.	Postoffice.	Name and number of animal.	Premium.	Amount.
<i>Herd of 1 bull and 4 cows.</i>				
D. W. Brown	Tiffin	Name of bull: Tippecanoe, 34,004. Name of cows: Nellie, Tippecanoe, Rose, Sallie Bell, and Cherry.		
J. O. Edwards & Son	Youngstown	Name of bull: Airdrie P. Hill 3d, 49708. Name of cows: Ella Moore 5th, Princess Ad. 3d, Ella Moore 7th, and Red Fancy 4th.		
F. H. Johnson & Co.	South Bend, Ind.	Name of bull: Dakota, 6298. Name of cows: Staunton Lass, Dameton Red Rose, Stately Maid, and Hermonia of Dameton.		
J. T. Miller	Marble Cliff	Name of bull: Donald Duke. Name of cows: Jessie Hopewell, Jessie Hope-well 10th, Lady Whiteface, and Lass of Plainview 5th.		
C. C. Walker & Son	New Madison	Name of Bull: Aclam Sharon 3d. Name of cows: Profitable 16th, Profitable 21st, Greenwood Louan 47th, and Mayflower 6th.		
D. D. Richards	Newark	Name of bull: Young Rocket. Name of cows: Belle of Walnut 5th, Mamie Sharon, Minnie's Gem, and Lulu 2d.		
James R. Anderson	Anderson	Name of Bull: Enterprise. Name of cows: Jennie May, Minnie Springdale 2d, Jennie Howell 1st, Jennie Howell 2d.	First.	\$100 or G. M.
<i>Three cows each, with her own calf.</i>				
D. W. Brown	Tiffin	Name of cows: Tippecanoe Rose, Nellie, and Cherry.	First.	75 00
C. C. Walker & Son	New Madison	Profitable 16th, Profitable 21st, and Greenwood Louan 47th.		
<i>Bull of any age or class.</i>				
G. S. Cloyd	Ithaca	Hero, 4952.	First.	50 00
J. O. Edwards & Sons	Youngstown	Airdrie of Pleasant Hill, 49708.		
F. H. Johnson & Co.	South Bend, Ind.	Dakota, 6298.		
Harness Tenick	Strickville	Aclam Sharon 3d.		
C. C. Walker & Son	New Madison	Young Rocket.		
D. D. Richards	Newark	Enterprise.		
Jas. K. Anderson & Sons	Anderson			
<i>Cow of any age or class.</i>				
J. O. Edwards & Sons	Youngstown	Ella Moore 7th.		
F. H. Johnson & Co.	South Bend, Ind.	Damton Red Rose, 11009.		
James T. Miller	Marble Cliff	Lass of Plainview 5th.		

C. C. Walker & Son..... same	New Madison.....	Profitable 16th.....	First.....	50 00
Jas. R. Anderson & Sons.....	Anderson.....	Profitable 21st.....		
N. S. Olin & Son.....	Streetsboro.....	Jennie May.....		
		Lady Florence.....		
		<i>Breeding bull, with 5 of his calves.</i>		
D. W. Brown.....	Tiffin.....	Col. Judy, 47894.....		
James T. Miller.....	Marble Cliff.....	Donald Duke.....	First.....	75 00
C. C. Walker & Son.....	New Madison.....			
D. D. Richards.....	Newark.....	Young Rocket.....		

SWEEPSTAKES ON MILK AND CHEESE BREEDS.

[To include Holsteins, Ayrshires, etc. For pedigrees, see classes.]

Owner.	Postoffice.	Name and number of animal.	Premium.	Amount.
Fairweather & Mason.....	McLane, Pa.....	Name of bull: Premier, 2921. Name of cows: Goldena, Lucia, Eunla, and Carrie ^{2d}		
Henry Batts.....	Wellington.....	Name of bull: Jacob Henry. Name of cows: Blanche Burns, Bright Eyes, Lily of Hudson, and Blanche Burns ^{2d}		
F. C. Stevens.....	Attica, N. Y.....	Name of bull: Constantyn. Name of cows: Rhoda, Eurice, Jewel, and Lutsky	First.....	\$100 or G. M.
Rumsey Bros.....	Westfield, N. Y.....	Name of bull: Marquis ^{2d} . Name of cows: Lady Eliza, Blossom, Betsy, and Plum		
T. E. Wight.....	Millbury.....			
Thos. Yates & Son.....	Delaware.....			
James L. Henderson.....	Washington, Pa.....	Name of bull: Jacob. Name of cows: Bride, De Vries, Castine, and Yeazer		
J. W. Stillwell & Co.....	Troy.....	Key		
		<i>Three cows, each with her own calf.</i>		
F. C. Stevens.....	Attica, N. Y.....		First.....	75 00
T. E. Wight.....	Millbury.....			
Thos. Yates & Son.....	Delaware.....			

SWEEPSTAKES ON BUTTER BREEDS.

(To include Jerseys, Guernseys, etc. For pedigrees see classes.)

Owner.	Postoffice.	Name and number of animal.	Premium.	Amount.
Parsons & Black	Worthington.	<i>Herd of 1 bull and 4 cows or heifers.</i>		
G. M. Hoover, manager.	Urbana	Name of bull: Gray King, 5219. Name of cows: Annie Dean, 20334; Annie Gray 2d, 11712; Double Rex Pansy, 14645; Katie Miller, 10191		
J. W. Stillwell & Co.	Troy	Name of bull: Prince Victor. Name of cows: Highland Pride, Calperma, Pennsylvania, and O'Bella B.		
F. H. Johnson & Co.	South Bend, Ind	Name of bull: Jacob. Name of cows: DeVries, Pride, Castine, and Yeager Key		
		Name of bull: Duke of Willow Grove. Name of cows: Little Patience, Marefile, Avama, Forest Lulu	First	\$100 00 org. med
Parsons & Black	Worthington.	<i>Three cows, each with her own calf.</i>		
G. M. Hoover, manager.	Urbana	Annie Dean, 20334; Annie Gray 2d, Double Rex Pansy, 14645.	First	75 00
J. W. Stillwell & Co.	Troy	Pennsylvania, Highland Pride, and Wildred		
Ohio State University	Columbus	Castine, DeVries, and Pride		
Parsons & Black	Worthington.	<i>Bull any age or class.</i>		
Isaac Riegel	Cedar Hill	Gray King, 5219		
G. M. Hoover, manager.	Urbana	Hebe's Butter Stamp, 6852		
J. W. Stillwell & Co.	Troy	Prince Victor		
F. H. Johnson & Co.	South Bend, Ind	Jacob	First	50 00
		Duke of Willow Grove.		
Parsons & Black	Worthington	<i>Cow any age or class.</i>		
G. M. Hoover, manager.	Urbana	Annie Gray 2d, 11712		
J. W. Stillwell & Co.	Troy	Pennsylvania		
F. H. Johnson & Co.	South Bend, Ind	Pride of DeVries	First	50 00
		Little Patience		
Isaac Riegel	Cedar Hill	<i>Breeding bull with 3 of his calves.</i>		
T. B. Van Horne & Co.	Columbus	Name of bull: Stokepogie Prince	First	75 00
J. W. Stillwell & Co.	Troy	Name of bull: Jacob, 608		

DAIRY STOCK.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Milking cow of any age.</i>			
H. C. Stevens, Attica, N. Y.	Rhoda, 434.....	First	\$30 00
same	Jewel, 668.....	Second ..	25 00
J. W. Stillwell & Co., Troy	DeVries		
same	Castine		
<i>Butter cow of any age.</i>			
G. M. Hoover, manager, Urbana.....	Princes Imperial	Second ..	25 00
J. W. Stillwell & Co., Troy	DeVries	First	30 00
same	Castine		
<i>Milking cow under 3 years old.</i>			
C. Stevens, Attica, N. Y.	Tirrannia.....	First	15 00
W. Stillwell & Co., Troy	Yaeger Key.....		
same	Metje Hartog.....	Second ..	10 00

FAT CATTLE.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Bullock 3 years and over.</i>			
Ooen, Marion.....		Second ..	\$20 00
Waddel, Marion.....		First	30 00
<i>Steer 2 years and under 3.</i>			
W. Hiskett & Sons, Fulton	Jumbo	First	30 00
Ooen, Marion.....		Second ..	20 00
<i>Steer under 2 years.</i>			
W. Hiskett & Sons, Fulton	Criswell.....		
E. Blanchard, Morenci, Mich.	Colonel	First	30 00
same	Shimmel		
same	Bloom		
same	Reno.....		
Waddel, Marion.....	Orio	Second ..	20 00
<i>Fat cow or heifer, any class or breed.</i>			
A. Johnson & Co., South Bend, Ind		First	20 00

SHEEP.—MERINOS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 3 years and over.</i>			
Copper & McFarland, Mt. Vernon			
Book & Merse, Raymond's P. O.		Third ...	\$5 00
D. Pugh & Son, Fairview, W. Va			
Copper & McFarland, Mt. Vernon			
E. W. Thomas & Co., New London		Second ..	10 00
Sherrwood & Blamer, Johnstown			
Wells & Staley, Lewis Center.....		First	25 00

SHEEP.—MERINOS—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 2 years and under 3.</i>			
M. P. Ashbrook, Granville.....
Copper & McFarland, Mt. Vernon.....
D. Pugh & Son, Fairview, W. Va.....	First.....	\$20 00
M. P. Ashbrook, Granville.....	Second.....	10 00
Copper & McFarland, Mt. Vernon.....
J. W. Pollock, Cedarville.....
Allen McDonald, Hookstown, Pa.....	Third.....	5 00
<i>Ram 1 year and under 2.</i>			
Sherwood & Blamer, Johnstown.....
Copper & McFarland, Mt. Vernon.....
same.....
W. H. Minns, New London.....
Cook & Morse, Raymonds.....
D. Pugh & Son, Fairview, W. Va.....
D. W. Thomas & Co., New London.....
Willis & Staley, Lewis Center.....	First.....	20 00
same.....
same.....	Second.....	10 00
Allen McDonald, Hookstown, Pa.....	Third.....	5 00
<i>Ram lamb.</i>			
Sherwood & Blamer, Johnstown.....	Standard, 132.....	.....	.....
M. P. Ashbrook, Granville.....
same.....	M. Ashbrook, No. 109.....	.....	.....
same.....	M. Ashbrook, No. 110.....	.....	.....
Cook & Morse, Raymond.....
D. Pugh & Son, Fairview, W. Va.....
S. W. Thomas & Co., New London.....	S. W. Thomas, 805.....	Second.....	8 00
Willis & Staley, Lewis Center.....	First.....	10 00
Allen McDonald, Hookstown, Pa.....	Third.....	5 00
<i>Pen of 3 ewes 3 years and over.</i>			
M. P. Ashbrook, Granville.....
same.....
Copper & McFarland, Mt. Vernon.....
same.....
Cook & Morse, Raymond.....	Third.....	5 00
D. Pugh & Son, Fairview, W. Va.....
Willis & Staley, Lewis Center.....	First.....	20 00
Allen McDonald, Hookstown, Pa.....	Second.....	10 00
<i>Pen of 3 ewes 2 years and under 3.</i>			
M. P. Ashbrook, Granville.....
Copper & McFarland, Mt. Vernon.....
Cook & Morse, Raymond.....
D. Pugh & Son, Fairview, W. Va.....
M. P. Ashbrook, Granville.....
Copper & McFarland, Mt. Vernon.....
J. W. Pollock, Cedarville.....
S. W. Thomas & Co., New London.....	First.....	20 00
same.....
Willis & Staley, Lewis Center.....	Second.....	10 00
Allen McDonald, Hookstown, Pa.....	Third.....	5 00
<i>Pen of 3 ewes under 2 years.</i>			
M. P. Ashbrook, Granville.....
same.....
same.....
Copper & McFarland, Mt. Vernon.....
same.....
Cook & Morse, Raymond.....
D. Pugh & Son, Fairview, W. Va.....	Third.....	5 00
J. W. Pollock, Cedarville.....
S. W. Thomas & Co., New London.....	Second.....	10 00
Willis & Staley, Lewis Center.....
Allen McDonald, Hookstown, Pa.....	First.....	20 00
Sherwood & Blamer, Johnstown.....

SHEEP.—MERINOS—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Pen of 3 ewe lambs.</i>			
Sherwood & Blamer, Johnstown			
M. P. Ashbrook, Granville.....			
same			
Cook & Morse, Raymond		Third	\$5 00
D. Pugh & Son, Fairview, W. Va.....		Second	10 00
S. W. Thomas & Co., New London			
Allen McDonald, Hookstown, Pa.....		First	15 00
<i>Five fleeces fine wool.</i>			
B. Waddle, Marion.....			
Jas. Mills, Updegraff.....			
<i>Five fleeces long wool.</i>			
B. Waddle, Marion.....			
<i>Five fleeces medium wool.</i>			
E. Waddle, Marion.....			

BLACK TOP AND DELAIN MERINOS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 2 years and over.</i>			
Jas. M. Quivey, Houstonville, Pa		First	\$15 00
J. G. Paxton & Sons, Houstonville, Pa.....		Second	10 00
T. M. Paxton, McConnell's Mills, Pa			
Alvin Craig, Cadiz	Jumbo, 397.....		
Jas. Mills, Updegraff.....			
<i>Ram under 2 years.</i>			
Jas. M. Quivey, Houstonville, Pa		First	15 00
J. G. Paxton & Sons, Houstonville, Pa.....		Second	10 00
Alvin Craig, Cadiz	Thurman.....		
Jas. Mills, Updegraff.....			
T. M. Paxton, McConnell's Mills, Pa			
<i>Ram lamb.</i>			
J. G. Paxton & Sons, Houstonville, Pa.....		First	10 00
T. M. Paxton, McConnell's Mills, Pa.....		Second	5 00
Alvin Craig, Cadiz			
Jas. Mills, Updegraff			
<i>Three ewes over 2 years.</i>			
Jas. M. Quivey, Houstonville, Pa			
J. G. Paxton & Sons, Houstonville, Pa.....		Second	8 00
T. M. Paxton, McConnell's Mills, Pa			
Alvin Craig, Cadiz.....		First	12 00
Jas. Mills, Updegraff.....			
<i>Three ewes under 3 years.</i>			
Jas. M. Quivey, Houstonville, Pa		First	12 00
G. J. Paxton & Sons, Houstonville, Pa.....		Second	8 00
T. M. Paxton, McConnell's Mills, Pa			
Alvin Craig, Cadiz.....			
Jas. Mills, Updegraff.....			

SHEEP.—BLACK TOP AND DELAIN MERINOS—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Three ewe lambs.</i>			
J. G. Paxton & Sons, Houstonville, Pa.....		Second.	\$4 00
T. M. Paxton, McConnell's Mills, Pa.....		First	8 00
Alvin Craig, Cadiz			
James Mills, Updegraff.....			

LONG WOOLS.

To include Lincolns, Cotswolds, and Leicesters.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 2 years and over.</i>			
Artz Bros., Osborne		First	\$20 00
James L. Henderson, Washington, Pa.....			
Daniel M. Beard, Anderson		Second.	10 00
same			
E. L. Neal, Gallipolis			
<i>Ram under 2 years.</i>			
Artz Bros., Osborne		First	15 00
Thos. B. Bennington, La Porte			
Daniel M. Beard, Anderson		Second.	10 00
same			
<i>Ram lamb.</i>			
Artz Bros., Osborne		First	10 00
<i>Pen of 3 ewes over 2 years.</i>			
Artz Bros., Osborne		First	15 00
<i>Pen of 3 ewes under 2 years.</i>			
Artz Bros., Osborne		First	12 00
Daniel M. Beard, Anderson		Second.	8 00
<i>Pen of 3 ewe lambs.</i>			
Artz Bros., Osborne		First	8 00
Daniel M. Beard, Anderson.....		Second.	4 00

DOWNS.

To include Oxforddowns, Hampshiredowns, and Shropshiredowns.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 2 years and over.</i>			
D. Postle & Son, Alton.....			
Thos. B. Bennington, La Porte	Broadland.....		
George H. German, Franklin, Mich.....			

SHEEP.—Downs—Continued.

To include Oxforddowns, Hampshiredowns, and Shropshiredowns.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
Ram 2 years and over—Continued.			
E. S. Butler, Ridgeway	Barnly	First	\$20 00
J. F. Rundel, Burmingham, Mich		Second	10 00
Ram under 2 years.			
Sherwood Blamer, Johnstown	Commander	Second	8 00
F. L. Postle, Camp Chase			
Thos. B. Bennington, La Porte	F. L. Minton	First	15 00
E. S. Butler, Ridgway			
J. F. Rundel, Burmingham, Mich			
Ram lamb.			
T. D. Postle, Alton	Safeguard	Second	5 00
Sherwood Blamer, Johnstown			
F. L. Postle, Camp Chase	Fortune	First	10 00
Thos. B. Bennington, La Porte			
George H. German, Franklin			
J. F. Rundel, Burmingham, Mich			
S. H. Todd, Wakeman			
Pen of 3 ewes over 2 years.			
Thos. B. Bennington, La Porte		Second	8 00
E. S. Butler, Ridgway		First	15 00
J. F. Rundel, Burmingham, Mich			
same			
Pen of 3 ewes under 2 years.			
Thos. B. Bennington, La Porte		Second	8 00
E. S. Butler, Ridgway		First	15 00
J. F. Rundel, Burmingham, Mich			
same			
Pen of 3 ewe lambs.			
Thos. B. Bennington, La Porte			
George H. German, Franklin, Mich			
same		First	10 00
J. F. Rundel, Burmingham, Mich		Second	5 00
S. H. Todd, Wakeman			

SOUTHDOWNS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram 2 years and over.</i>			
J. O. Leffel, New Carlisle	Perlew	Second	\$10 00
Thos. B. Bennington, La Porte			
W. D. & L. C. Anderson, La Porte	Hamilton	First	20 00
<i>Ram under 2 years.</i>			
J. O. Leffel, New Carlisle	Fisher		
Thos. B. Bennington, La Porte			
J. F. Rundel, Birmingham, Mich	Ohio Standard	First	15 00
W. D. & L. C. Anderson, Anderson		Second	8 00
same			

SHEEP.—SOUTH DOWNS—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram lamb.</i>			
Thos. B. Bennington, La Porte.....	Jno. Webb		
J. F. Rundel, Birmingham, Mich.....		Second.	\$5
W. D. & L. C. Anderson, Anderson.....		First ..	10
<i>Pen of 3 ewes over 2 years.</i>			
J. O. Leffel, New Carlisle		Second.	8 0
W. D. & L. C. Anderson, Anderson.....		First ..	15 0
<i>Pen of 3 ewes under 2 years.</i>			
J. O. Leffel, New Carlisle		Second.	8 0
J. F. Rundel, Birmingham, Mich.....		First ..	15
W. D. & L. C. Anderson, Anderson.....			
<i>Pen of 3 ewe lambs.</i>			
J. O. Leffel, New Carlisle		First ..	10
J. F. Rundel, Birmingham, Mich.....		Second.	5
W. D. & L. C. Anderson, Anderson.....			

FAT SHEEP.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Pen of 3 fat wethers 2 years and under 3.</i>			
T. D. Postle, Alton		Second.	\$8 0
B. Waddle, Marion.....		First ..	15 0
J. F. Rundel, Birmingham, Mich.....			
<i>Pen of 3 fat wethers 1 year and under 2.</i>			
T. D. Postle, Alton		First ..	15 00
B. Waddle, Marion.....		Second.	8 0
J. F. Rundel, Birmingham, Mich.....			
<i>Pen of 3 lamb wethers.</i>			
T. D. Postle, Alton			
J. F. Rundel, Birmingham, Mich.....			
<i>Single fat wethers.</i>			
T. D. Postle, Alton		Second.	5 00
B. Waddle, Marion.....		First ..	10 00
W. D. & L. C. Anderson, Anderson.....			

SWEEPSTAKES ON FINE WOOL SHEEP.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram with five of his get.</i>			
M. P. Ashbrook, Granville.....			
Copper & McFarland, Mt. Vernon.....			
Willis & Staley, Lewis Center.....		First ..	\$25 0

SHEEP.—SWEEPSTAKES ON FINE WOOL SHEEP—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram with 5 of his get—Continued.</i>			
Cook & Morse, Raymond.....			
D. Pugh & Son, Fairview, W. Va.....			
Alvin Craig, Cadiz.....			
Jas. Mills, Updegraff.....			
S. W. Thomas & Co., New London.....			
<i>Flock of Merinos.</i>			
M. P. Ashbrook, Granville.....			
D. Pugh & Son, Fairview, W. Va.....			
J. W. Pollock, Cedarville.....		First	\$25 00
Allen McDonald, Hookstown, Pa.....			
<i>Flock of Black Top Merinos.</i>			
J. G. Paxton & Sons, Houstonville, Pa.....			
T. M. Paxton, McConnell's Mills, Pa.....		First	25 00
Alvin Craig, Cadiz.....			
Jas. Mills, Updegraff.....			

SWEEPSTAKES ON LONG WOOL SHEEP.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Ram with 3 of his get.</i>			
Artz Bros., Orborne.....		First	\$20 00
Daniel M. Beard, Anderson.....			
<i>Ewe with 2 of her lambs.</i>			
Artz Bros., Osborne.....		First	15 00
Daniel M. Beard, Anderson.....			
<i>Flock of 1 ram and 5 ewes.</i>			
Artz Bros., Orborne.....		First	20 00
Daniel M. Beard, Anderson.....			

SWEEPSTAKES ON SOUTHDOWNS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Flock of 1 ram and 5 ewes.</i>			
J. O. Leffel, New Carlisle.....			
W. D. & L. C. Anderson, Anderson.....		First	\$15 00
Copper & McFarland, Mt. Vernon.....			

SHEEP.—SWEEPSTAKES ON OXFORDDOWNS, HAMPSHIREDOWNS, AND SHROPSHIREDOWNS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Flock of 1 ram and 5 ewes of either of the above downs.</i>			
Thos. B. Bennington, La Porte.....			
J. F. Rundel, Birmingham, Mich.....			
E. S. Butler, Ridgway.....		First	\$15 00

SWINE.—BERKSHIRES.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar 2 years and over.</i>			
George W. Penny, Newark.....	Royal Gloster, 10195.....	Second	\$15 00
D. W. Todd & Sons, Urbana.....	Royal Oxford, 10043	First	20 00
<i>Boar 1 year and under 2.</i>			
D. W. Todd & Sons, Urbana.....	Duke of Morgan, 12220.....	First	20 00
<i>Boar 6 months and under 1 year.</i>			
George W. Penny, Newark.....			
D. W. Todd & Sons, Urbana.....		First	15 00
Clifford & White, Wellington.....		Second	10 00
<i>Boar under 6 months.</i>			
George W. Penny, Newark.....	Queen's Gloster.....		
D. W. Todd, Urbana.....	Gen. Sherman, 14095	First	10 00
Clifford & White, Wellington.....	Vim		
same	Don	Second	5 00
<i>Sow 2 years and over.</i>			
George W. Penny, Newark.....	Juliette, 10193.....		
D. W. Todd & Sons, Urbana.....	Lady Ambrose, 11845.....	First	20 00
same	Lucille, 11857		
Clifford & White, Wellington.....	Darling, 11131.....	Second	10 00
<i>Sow 1 year and under 2.</i>			
D. W. Todd & Sons, Urbana.....	Queen of Ohio, 14088.....	First	15 00
<i>Sow 6 months and under 1 year.</i>			
George W. Penny, Newark.....	Countess, 13466		
D. W. Todd & Sons, Urbana.....	Lady Gordon, 14093	Second	8 00
same	Lady Grant, 14092		
Clifford & White, Wellington.....	Gem, 13903.....	First	12 60
<i>Sow under 6 months.</i>			
D. W. Todd & Sons, Urbana.....	Lady Sherman, 14096.....		
Clifford & White, Wellington.....	Fanny Fern.....	Second	5 00
same	Happy	First	10 00
<i>Sow with litter of 6 pigs</i>			
Clifford & White, Wellington.....		Second	15 00

SWINE.—POLAND CHINAS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar 2 years and over.</i>			
Lon Hunter, Morrow	U. S. 2d, 6227	First	\$20 00
H. Bradford, Rochester Depot	London Boy, 4003	Second	15 00
<i>Boar 1 year and under 2.</i>			
Frank Plessinger, Beamsville	Grover C		
A. Slade, Jayesville	Bravo K	Second	15 00
L. C. Nixon, Ft. Ancient	Cleveland, Vol. 2d		
H. Bradford, Rochester Depot	Perfection, 7685	First	20 00
<i>Boar 6 months and under 1 year.</i>			
Seely Hizar, Ft. Ancient			
Richardson & Margrue, Westville	Aron Mc		
A. Slade, Jayesville	Black Tom		
same	Black Joe		
L. C. Nixon, Ft. Ancient		Second	10 00
Lon Hunter, Morrow	Monarch		
Lampee Bros., Van Wert	King Cousin	First	15 00
same	Jumbo		
<i>Boar under 6 months.</i>			
Frank Plessinger, Beamsville		Second	5 00
Seely Hizar, Ft. Ancient			
Z. T. Smith & Bro., Upper Sandusky			
A. Slade, Jayesville	Black Dick		
L. C. Nixon, Ft. Ancient		First	10 00
Lon Hunter, Morrow	U. S. Jr.		
Lampee Bros., Van Wert	Black Tom		
<i>Sow 2 years and over.</i>			
Frank Plessinger, Beamsville	Black Bess, 11444		
L. C. Nixon, Ft. Ancient	Daisy Dean 3d, 12106		
same	Mother Hubbard, 9702		
Lon Hunter, Morrow	Lady Warren, 13600	Second	10 00
Lampee Bros., Van Wert	Lady Hunter	First	20 00
<i>Sow 1 year and under 2.</i>			
Frank Plessinger, Beamsville	Princess	Second	10 00
L. C. Nixon, Ft. Ancient	Bonnie Belle 2d, 46668		
Lon Hunter, Morrow	Maud		
Lampee Bros., Van Wert			
H. Bradford, Rochester Depot	Reno	First	15 00
<i>Sow 6 months and under 1 year.</i>			
Seely Hizar, Ft. Ancient			
Richardson, Westville	Abba Mc		
Lon Hunter, Morrow	Beauty		
Lampee Bros., Van Wert	Lulu	Second	8 00
same	H. L.	First	15 00
same	Lady Corwin		
same	Batter		
same	First Choice		
<i>Sow under 6 months.</i>			
Frank Plessinger, Beamsville			
Seely Hizar, Ft. Ancient			
S. F. Smith & Bros., Upper Sandusky			
A. Slade, Jayesville	Black Maid		
L. C. Nixon, Ft. Ancient	Ohio Belle 2d	Second	5 00
Lon Hunter, Morrow	Daisy H.		
Lampee Bros., Van Wert	Lady Corwin		
H. Bradford, Rochester Depot	Perfect	First	10 00
same	Pride		
<i>Sow with litter of sucking pigs.</i>			
Deboice Shoemaker, Columbus	Lilly Dale	Second	15 00

CHESTER WHITES.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar 2 years old and over.</i>			
S. H. Todd, Wakeman	Grant 2d	First	\$15 00
J. H. & H. P. Eaton, Bucyrus.....	General Hancock.....	Second	10 00
<i>Boar 1 year and under 2.</i>			
C. W. Baker, Mansfield	Grant 4th	First	15 00
S. H. Todd, Wakeman	White Star	Second	10 00
H. W. Minns, New London.....	Slim Tail, 329		
J. H. & H. P. Eaton, Bucyrus.....	Cleveland, 67	Second	10 00
same	Eaton's King, 103.....		
<i>Boar 6 months and under 1 year.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	Captain	Second	5 00
H. W. Minns, New London.....	Oscar Wilde	First	10 00
J. H. & H. P. Minns, Bucyrus	Bob.....		
<i>Boar under 6 months.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	Hannibal.....	First	8 00
same	George		
H. W. Minns, New London.....	.....	Second	4 00
J. H. & H. P. Eaton, Bucyrus .....	.....	
<i>Sow 2 years and over.</i>			
S. H. Todd, Wakeman	Clo	Second	10 00
same	Lady Ross		
J. H. & H. P. Eaton, Bucyrus	Sweepstakes, 708	First	15 00
<i>Sow 1 year and under 2.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	Lady Bates 4th	First	15 00
J. H. & H. P. Eaton, Bucyrus	Wakeman Belle, 750	Second	10 00
same	Holmes Belle.....		
<i>Sow 6 months and under 1 year.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	La Porte 6th.....	First	10 00
H. W. Minns, New London.....	Cleopatra.....		
J. H. & H. P. Eaton, Bucyrus.....	.....	Second	5 00
same .....	.....	.....	.....
<i>Sow under 6 months.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	Cora	Second	4 00
same	Vitality	First	8 00
W. H. Minns, New London .....	.....	.....	.....
J. H. & H. P. Eaton, Bucyrus .....	.....	.....	.....
<i>Sow with a litter of sucking pigs.</i>			
C. W. Baker, Mansfield .....	.....	.....	.....
S. H. Todd, Wakeman	Wakeman Belle	Second	15 00
H. W. Minns, New London.....	Belle of Lorain.....	First	20 00
J. H. & H. P. Eaton, Bucyrus.....	.....	.....	.....

SWINE.—SUFFOLK AND YORKSHIRE BREEDS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar of any age.</i>			
John J. Maxon, Gallipolis.....	Gus, Yorkshire.....	Second.	\$10 00
same	Gallia.....		
Thos. B. Bennington, La Porte.....	Clifton.....		
J. G. Paxton & Sons, Houstonville.....	Smuggler, 165.....		
same	Rex, 201.....	First	15 00
<i>Sow of any age.</i>			
John J. Maxon, Gallipolis.....	Lady York.....		
same	Lady Gallia.....		
Thos. B. Bennington, La Porte.....	Glendale.....		
J. G. Paxton & Sons, Houstonville.....	Princess 3d, 207.....	Second.	5 00
same	Mollie Pender.....		
Chas. McClave, New London.....		First	10 00
same			

DUROC OR JERSEY RED BREEDS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar 1 year and under 2.</i>			
Maynard Pond, Logan.....	Red Rover.....	First	\$15 00
Jas. H. Valentine, Duval.....	Enterprise.....	Second.	10 00
<i>Boar 6 months and under 1 year.</i>			
Jas. H. Valentine, Duval.....		Second.	5 00
Samuel Taylor, Pleasant Corners.....		First	10 00
same			
<i>Sow 2 years and over.</i>			
Samuel Taylor, Pleasant Corners.....			
same		Second.	10 00
<i>Sow 1 year and under 2.</i>			
Maynard Pond, Logan.....	Belle.....		
Jas. H. Valentine, Duval.....	Sallie of Duval, 2012.....	Second.	10 00
Samuel Taylor, Pleasant Corners.....	Taylor's Rosebud, 1570.....	First	15 00
<i>Sow 6 months and under 1 year.</i>			
Maynard Pond, Logan.....	Beauty.....	First	10 00
Samuel Taylor, Pleasant Corners.....	Violet, 2596.....	Second.	5 00
same			

SWINE SWEEPSTAKES.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar any age or breed.</i>			
Jas. H. Valentine, Duval.....	Enterprise, 383.....		
D. W. Todd & Sons, Urbana.....	Duke of Morgan, 12220.....		
A. Slade, Jayesville.....	Bravo K.....		

SWINE.—SWINE SWEEPSTAKES—Continued.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Boar of any age or breed—Continued.</i>			
J. H. & H. P. Eaton, Bucyrus	Cleveland, 6799		
L. C. Nixon, Ft. Ancient	King Corwin		
Lampee Bros., Van Wert	Perfection, 7685	First	\$25 00
H. Bradford, Rochester Depot	U. S. 2d, 6227		
Lon Hunter, Morrow			
<i>Sow any age or breed.</i>			
Frank Plessinger, Beamsville	Princess		
D. W. Todd & Sons, Urbana	Lady Ambrose, 11845		
Richardson & Margrue, Westville	Abba Mc		
J. H. & H. P. Eaton, Bucyrus	Lady Warren, 13620		
Lon Hunter, Morrow	Maud		
same	Lady Hunter	First	20 00
Lampee Bros., Van Wert	Perfect		
H. Bradford, Rochester Depot			
<i>Herd of one boar and three sows.</i>			
S. H. Todd, Wakeman			
Richardson & Margrue, Westville	Abba Mc, Allie Mc, Dot. Mc		
J. H. & H. P. Eaton, Bucyrus		First	25 00
L. C. Nixon, Ft. Ancient			
Lon Hunter, Morrow	Lady Warren, Maud, Beaty		
<i>Sow of any breed with three of her pigs under one year.</i>			
S. H. Todd, Wakeman		First	25 00
<i>Three boars under one year.</i>			
S. H. Todd, Wakeman		First	25 00
Richardson & Margrue, Westville			
J. H. & H. P. Eaton, Bucyrus			
L. C. Nixon, Ft. Ancient			
<i>Three sows under one year.</i>			
S. H. Todd, Wakeman			
D. W. Todd & Sons, Urbana			
Richardson & Margrue, Westville		First	25 00
J. H. & H. P. Eaton, Bucyrus			
L. C. Nixon, Ft. Ancient			
Lon Hunter, Morrow			

FAT HOGS.

Owner's name, and postoffice.	Name of animal.	Premium.	Amount.
<i>Fat barrow any age.</i>			
S. H. Todd, Wakeman			
<i>Barrow under one year.</i>			
S. H. Todd, Wakeman			

POULTRY—Continued.

Name and address.	Kind of fowl.	Premium.
GAME—Continued.		
S. E. Wurst, Elyria.....	Best pair black-breasted game chicks.....	\$2 00
same.....	Best pair brown-breasted game fowls.....	3 00
Eugene Sites, West Dover.....	Best pair yellow duck-wing game fowls.....	3 00
S. E. Wurst, Elyria.....	2d best " " " ".....	2 00
same.....	Best pair silver-wing game fowls.....	3 00
same.....	2d best " " " ".....	3 00
Eugene Sites, West Dover.....	Best pair red pile game.....	3 00
S. E. Wurst, Elyria.....	2d best " " " ".....	2 00
Eugene Sites, West Dover.....	Best pair white pile game.....	3 00
Jas. Lindsey, Madison Mills.....	2d best " " " ".....	2 00
S. E. Wurst, Elyria.....	Best pair white game.....	2 00
Eugene Sites, West Dover.....	2d best " " " ".....	1 00
S. E. Wurst, Elyria.....	Best pair black game.....	2 00
Jas. Lindsey, Madison Mills.....	Best pair blue game.....	2 00
S. E. Wurst, Elyria.....	2d best " " " ".....	1 00
AMERICAN.		
J. L. Mock, Columbus.....	Best pair Plymouth Rock fowls.....	3 00
C. Harris, Columbus.....	2d best " " " ".....	3 00
Chas. McClave, New London.....	Best pair Plymouth Rock chicks.....	2 00
J. L. Mock, Columbus.....	2d best " " " ".....	1 00
C. Harris, Columbus.....	Best pair Dominques.....	3 00
same.....	2d best " " " ".....	2 00
Chas. McClave, New London.....	Best pair Wyandotte.....	3 00
J. L. Mock, Columbus.....	2d best " " " ".....	2 00
BANTAMS.		
S. E. Wurst, Elyria.....	Best pair black-breasted red Bantams.....	3 00
Jas. Lindsey, Madison Mills.....	2d best " " " ".....	2 00
Eugene Sites, West Dover.....	Best pair brown-red Bantams.....	2 00
same.....	2d best " " " ".....	1 00
same.....	Best pair yellow duck-wing Bantams.....	2 00
Chas. McClave, New London.....	2d best " " " ".....	1 00
same.....	Best pair silver duck-wing Bantams.....	2 00
Eugene Sites, West Dover.....	2d best " " " ".....	1 00
same.....	Best pair red pile Bantams.....	2 00
H. M. & C. S. Gier, Columbus.....	2d best " " " ".....	1 00
Eugene Sites, West Dover.....	Best pair white pile Bantams.....	2 00
same.....	2d best " " " ".....	1 00
S. E. Wurst, Elyria.....	Best pair golden Seabright Bantams.....	3 00
Jas. Lindsey, Madison Mills.....	2d best " " " ".....	2 00
John F. Skees, Rochester.....	Best pair silver Seabright Bantams.....	3 00
S. E. Wurst, Elyria.....	2d best " " " ".....	2 00
same.....	Best pair black Rose Comb Bantams.....	2 00
same.....	2d best " " " ".....	1 00
Jas. Lindsey, Madison Mills.....	Best pair white Rose Comb Bantams.....	2 00
Eugene Sites, West Dover.....	2d best " " " ".....	1 00
John F. Skees, Rochester.....	Best pair Japanese Bantams.....	3 00
same.....	2d best " " " ".....	2 00
Jas. Lindsey, Madison Mills.....	Best pair booted white Bantams.....	2 00
Miscellaneous.		
S. E. Wurst, Elyria.....	Best pair Frizzled.....	2 00
same.....	Best pair Silkies.....	2 00
J. L. Mock, Columbus.....	Best pair black Java fowls.....	3 00
S. E. Wurst, Elyria.....	Best pair black Java chicks.....	2 00
C. Harris, Columbus.....	Best pair Langshan fowls.....	3 00
Chas. McClave, New London.....	2d best " " " ".....	2 00
S. E. Wurst, Elyria.....	Best four Capon fowls.....	5 00
same.....	Best four Capon chicks.....	3 00
same.....	2d best " " " ".....	2 00
TURKEYS.		
Chas. McClave, New London.....	Best pair bronze turkeys.....	3 00
J. L. Mock, Columbus.....	2d best " " " ".....	2 00
S. E. Wurst, Elyria.....	Best pair white turkeys.....	3 00
Jas. Lindsey, Madison Mills.....	2d best " " " ".....	2 00
same.....	Best pair black turkeys.....	3 00
S. E. Wurst, Elyria.....	Best pair slate turkeys.....	3 00

POULTRY.

Name and address.	Name of fowl.	Premium.
GEESE.		
Chas. McClave, New London.....	Best pair Toulouse geese.....	\$3 00
S. E. Wurst, Elyria.....	2d best ".....	2 00
Chas. McClave, New London.....	Best pair Embden geese.....	3 00
Eugene Sites, West Dover.....	2d best ".....	2 00
S. E. Wurst, Elyria.....	Best pair white China geese.....	3 00
James Lindsey, Madison Mills.....	2d best ".....	2 00
same.....	Best pair brown China geese.....	3 00
S. E. Wurst, Elyria.....	2d best ".....	2 00
DUCKS.		
Chas. McClave, New London.....	Best pair Pekin ducks.....	3 00
Eugene Sites, West Dover.....	2d best ".....	2 00
John F. Skees, Rochester.....	Best pair Rouen ducks.....	3 00
Chas. McClave, New London.....	2d best ".....	3 00
S. E. Wurst, Elyria.....	Best pair Aylesbury ducks.....	3 00
same.....	2d best ".....	2 00
same.....	Best pair Cayuga ducks.....	3 00
James Lindsey, Madison Mills.....	2d best ".....	2 00
Chas. McClave, New London.....	Best pair gray Call ducks.....	2 00
John F. Skees, Rochester.....	2d best ".....	1 00
James Lindsey, Madison Mills.....	Best pair white Muscovy ducks.....	2 00
S. E. Wurst, Elyria.....	Best pair colored Muscovy ducks.....	2 00
James Lindsey, Madison Mills.....	2d best ".....	1 00
S. E. Wurst, Elyria.....	Best pair Crested White ducks.....	2 00
James Lindsey, Madison Mills.....	2d best ".....	1 00
PIGEONS.		
S. E. Wurst, Elyria.....	Largest and best collection.....	5 00
Miscellaneous.		
C. Harris, Columbus.....	*Best incubator, to hatch not less than 80 per cent. of fertile eggs during the fair, and not less than 300 eggs capacity.....	20 00
James Lindsey, Madison Mills.....	For largest and best collection of pets of any variety.....	5 00
S. E. Wurst, Elyria.....	For 2d largest and best collection of pets of any variety.....	3 00

FLOUR, GRAIN, AND SEEDS.

Name and address.	Name of article.	Premium.
Maxfield & Bro., Chillicothe.....	Best bbl. red wheat flour.....	S. Med.
Maxwell, Hecker & Pomerend, Millersburg.....	2d best ".....	\$3 00
Whipps Bros., Marion.....	Best half bushel white winter wheat.....	5 00
M. L. Buchwalter, Hallsville.....	2d best ".....	3 00
J. & V. Keckley, Marysville.....	Best half bushel amber wheat.....	5 00
James Brown, Lexington.....	2d best ".....	3 00
Whipps Bros., Marion.....	Best half bushel red winter wheat.....	5 00
H. Buchwalter, Hallsville.....	2d best ".....	3 00
J. & V. Keckley, Marysville.....	Best half bushel spring wheat.....	5 00
Whipps Bros., Marion.....	Best sample of rye, one-half bushel.....	3 00
J. & V. Keckley, Marysville.....	2d best ".....	2 00
H. Buchwalter, Hallsville.....	Best sample of oats, one-half bushel.....	3 00
P. McGary, Jamestown.....	2d best ".....	2 00
Whipps Bros., Marion.....	Best sample of spring barley, one-half bushel.....	3 00
J. & V. Keckley, Marysville.....	2d best ".....	2 00
Whipps Bros., Marion.....	Best sample of winter barley, one-half bushel.....	3 00
J. & V. Keckley, Marysville.....	2d best ".....	2 00

FLOUR, GRAIN, AND SEEDS—Continued.

Name and address.	Name of article.	Premium.
Whipps Bros., Marion	Best sample of buckwheat, one-half bushel	\$3 00
H. Bieber, Delaware.....	" " flaxseed, one-half bushel.....	3 00
Whipps Bros., Marion	" " hops, not less than 10 lbs.....	3 00
"	" " timothy, half bushel	3 00
H. Buchwalter, Hallsville.....	2d best " "	1 00
A. W. Livingston & Sons, Columbus	Best " " clover seed, "	5 00
Isaac Freeman, Rex.....	2d best " "	2 00
A. W. Livingston, Columbus.....	Best " " blue grass seed, half bushel	3 00
Whipps Bros., Marion	" " red-top seed, half bushel	2 00
A. W. Livingston & Sons, Columbus	" " orchard grass seed, half bus.	3 00
Whipps Bros., Marion	" " millet seed, half bushel	3 00
"	" " Hung'n grass seed, half bus.	2 00
Miss Cora Bieber, Delaware ..	Best and greatest variety dried fruit.....	3 00
Mrs. S. W. Park, Hope.....	2d best " "	2 00
Whipps Bros., Marion	Best sample starch.....	1 00
J. & V. Keckley, Marysville.....	Best display cereals, straw or stalk	5 00
"	2d best " "	2 00
"	Best peck white beans, dry	2 00
Whipps Bros., Marion	2d best " "	1 00
J. & V. Keckley, Marysville.....	Best display of beans, 20 varieties.....	3 00
Whipps Bros., Marion	2d best " "	2 00
J. & V. Keckley, Marysville.....	Best half peck field peas, dry.....	2 00
A. W. Livingston & Sons, Columbus	2d best " "	1 00
Whipps Bros., Marion	Best and greatest variety of peas, dry.....	3 00
"	Best 5 lbs. Kentucky seed-leaf tobacco.....	3 00
"	" " Connecticut " "	3 00
"	" " Ohio " "	3 00
A. W. Livingston & Sons, Columbus	Best collection garden seeds	3 00
J. & V. Keckley, Marysville.....	2d best " "	2 00
A. W. Livingston & Sons, Columbus	Best display of grain, not including corn	10 00
Whipps Bros., Marion	2d best " "	5 00
"	Best display of leaf tobacco, with varieties properly named, etc.....	5 00

Awarding Committee.—Geo. Neilson, Miles Kester, E. A. Fobes.

CORN.

Name and address.	Name of article.	Premium.
A. M. Brown, Groveport.....	Best one-half bushel yellow corn in ear, 1884	\$5 00
J. & V. Keckley, Marysville.....	2d best " " " "	3 00
Whipps Bros., Marion	Best " " " " 1885	5 00
"	2d best " " " "	3 00
J. & V. Keckley, Marysville.....	Best one-half bushel white corn, 1884.....	5 00
Whipps Bros., Marion	2d best " " " "	3 00
J. M. Allen, Columbus.....	Best " " " " 1885	5 00
J. & V. Keckley, Marysville.....	2d best " " " "	3 00
Whipps Bros., Marion	Best one-half bushel white cap, 1884.....	5 00
J. & V. Keckley, Marysville.....	2d best " " " "	3 00
"	Best " " " " 1885	5 00
Whipps Bros., Marion	2d best " " " "	3 00
"	Best display sweet corn	3 00
Lewis Swickard, Columbus	2d best " "	1 00
Whipps Bros., Marion	Best display pop corn.....	2 00
J. & V. Keckley, Marysville.....	2d best " "	1 00
"	Best collection of corn in variety.....	5 00
Whipps Bros., Marion	2d best " "	2 00
J. & V. Keckley, Marysville.....	Best half bushel white corn meal	3 00
Whipps Bros., Marion	2d best " "	2 00
"	Best half bushel yellow corn meal.....	3 00
J. B. Wolford, Lancaster.....	2d best " "	2 00
"	Best barrel of hominy.....	3 00
Whipps Bros., Marion	Best barrel fine hominy or sample.....	3 00
"	Best specimen sweet corn, peck	3 00
"	Best 20 lbs. broom corn	5 00
J. H. Freeman, Kingston.....	2d best " "	3 00

Awarding Committee.—John Bonar, N. L. Smith, James H. Thompson.

CHEESE.

Name and address.	Name of article.	Premium.
E. A. Fobes, Lindenville	Best 3 cheese made June, 1885	\$5 00
same	" 3 cheese made July, 1885	5 00
same	" 3 cheese made August, 1885	5 00
same	" single cheese made any time	5 00
same	" and largest display	Sil. M.
same	" single cheese made any time	5 00
same	" 5 Cheddar cheese for foreign shipment	10 00
same	" 5 cheese for home consumption	10 00
same	" and largest display	Sil. M.

Awarding Committee.—A. B. Thompson, V. A. P. Ware, E. W. Brown.

BUTTER, BREAD, ETC.

Name and address.	Name of article.	Premium.
BUTTER.		
N. L. Smith, Lindonville	Best 10 pounds butter in rolls	\$5 00
Mrs. Henry Bieber, Delaware	2d best " "	3 00
N. L. Smith, Lindonville	Best 25 pounds butter made in May and June	8 00
Ely Taggart, Lewis Center	2d best " "	5 00
N. L. Smith, Lindonville	Best tub or firkin, 50 lbs., made at any time	8 00
Mrs. Mary Maxwell, Reynoldsburg	2d best " "	5 00
N. L. Smith, Lindonville	Best and largest exhibition of butter	Sil. M.
BREAD AND CEREAL FOOD.		
Mrs. Mary Maxwell, Reynoldsburg	Best 3 loaves domestic yeast bread	2 00
Mrs. J. E. Scobey, Columbus	2d best " "	1 00
Mrs. T. Pool, Reynoldsburg	Best 3 loaves domestic salt rising	2 00
Mrs. Henry Bieber, Delaware	Best 4 loaves bakers' bread	3 00
same	Best pilot bread	2 00
Mrs. Mary Phillips, Columbus	Best soda biscuit	2 00
J. & V. Keckley, Marysville	Best butter crackers	2 00
Mrs. H. Bieber, Delaware	Best sweet crackers	2 00
J. & V. Keckley, Marysville	Best Boston crackers	2 00
E. Levering, Baltimore, Md.	Best display of coffee	3 00
J. & V. Keckley, Marysville	Best display of spices	2 00
J. B. Wolford, Lancaster	Best domestic corn bread	2 00
Mrs. John Boyer, Circleville	2d best " "	2 00
Mrs. F. Pool, Reynoldsburg	Best display rye bread	2 00
Mrs. N. E. Lovejoy, Columbus	2d best " "	1 00
Mrs. Mary Maxwell, Reynoldsburg	Best display domestic brown bread	2 00
Mrs. T. Pool, "	2d best " "	1 00
Mrs. Mary Maxwell, "	Best display domestic Graham bread	2 00
Mrs. J. H. Ady, Columbus	2d best " "	1 00
Mrs. Lewis Swickard, Westerville	Best display domestic sponge cake	2 00
Mrs. Jessie McCoy, Chillicothe	2d best " "	1 00
Mrs. A. M. Brown, Groveport	Best display domestic raised biscuit	2 00
Mrs. Mary Maxwell, Reynoldsburg	2d best " "	1 00
Mrs. John Boyer, Circleville	Best yeast for domestic use	2 00
E. G. Taggart, Lewis Center	2d best " "	1 00
Mrs. Mary Maxwell, Reynoldsburg	Best 3 hams, mode of preserving stated	8 00
Mrs. T. Pool, "	2d best " "	4 00
Mrs. John Boyer, Circleville	Best 6 beef tongues	2 00
Mrs. Mary Maxwell, Reynoldsburg	Best 3 pieces dried beef	3 00

Awarding Committee.—Mrs. Estello, A. J. Hartor, B. B. Herriek.

PRESERVES, PICKLES, ETC.

Name and address.	Name of article.	Premium.
Mrs. Mary Maxwell, Reynoldsburg.....	Best canned tomatoes.....	\$2 00
Mrs. L. Trimble, Marion.....	2d best	1 00
Mrs. T. Pool, Reynoldsburg.....	Best canned blackberries.....	2 00
Mrs. S. Hatfield, Lebanon.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Best canned raspberries.....	2 00
Mrs. John Boyer, Circleville.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Best canned peaches.....	2 00
Mrs. T. Pool, Reynoldsburg.....	2d best	1 00
Mrs. Henry Bieber, Delaware.....	Best canned apples.....	2 00
Mrs. S. W. Park, Hope.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Best canned quinces.....	2 00
Mrs. T. Pool, Reynoldsburg.....	2d best	1 00
Mrs. John Boyer, Circleville.....	Best canned pears.....	2 00
Mrs. S. W. Park, Hope.....	2d best	1 00
same.....	Best canned cherries.....	2 00
Mrs. S. Hatfield, Lebanon.....	2d best	1 00
same.....	Best canned gooseberries.....	2 00
Mrs. T. Pool, Reynoldsburg.....	2d best	1 00
Mrs. S. Hatfield, Lebanon.....	Best canned currants.....	2 00
Mrs. Mary Maxwell, Reynoldsburg.....	2d best	1 00
Mrs. S. Hatfield, Lebanon.....	Best canned grapes.....	2 00
Mrs. T. Pool, Reynoldsburg.....	2d best	1 00
same.....	Best canned plums.....	2 00
Mrs. W. W. Farnsworth, Waterville.....	2d best	1 00
same.....	Best canned corn.....	2 00
Mrs. Wm. Holmes, Marion.....	2d best	1 00
Mrs. L. Trimble, Marion.....	Best canned peas.....	2 00
Mrs. Wm. Holmes, Marion.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Largest and best variety canned fruit.....	5 00
Mrs. T. Pool, Reynoldsburg.....	2d best	3 00
Mrs. P. Beerbower, Marion.....	Largest and best variety jellies.....	5 00
Mrs. S. Hatfield, Lebanon.....	2d best	3 00
Mrs. N. E. Lovejoy, Columbus.....	Largest and best variety pickles.....	5 00
Miss N. McBride, Pataskala.....	2d best	3 00
Mrs. W. W. Farnsworth, Waterville.....	Best apple jelly.....	2 00
Mrs. S. Hatfield, Lebanon.....	2d best	1 00
Mary J. Smith, Lindonville.....	Best currant jelly.....	2 00
Mrs. H. Bieber, Delaware.....	2d best	1 00
Mrs. Mary J. Smith, Lindonville.....	Best peach jelly.....	2 00
Mary B. Taggart, Lewis Center.....	2d best	1 00
same.....	Best quince jelly.....	2 00
Mrs. Mary Maxwell, Reynoldsburg.....	2d best	1 00
Mrs. John Boyer, Circleville.....	Best grape jelly.....	2 00
Mrs. H. Bieber, Delaware.....	2d best	1 00
Mrs. John Boyer, Circleville.....	Best preserved quinces.....	2 00
Mary B. Taggart, Lewis Center.....	2d best	1 00
Mrs. S. Hatfield, Lebanon.....	Best preserved pears.....	2 00
Mrs. John Boyer, Circleville.....	2d best	1 00
Mrs. H. Bieber, Delaware.....	Best preserved apples.....	2 00
Mrs. S. W. Park, Hope.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Best preserved plums.....	2 00
Mrs. T. Pool, Reynoldsburg.....	2d best	1 00
same.....	Best preserved grapes.....	2 00
Mary B. Taggart, Lewis Center.....	2d best	1 00
Mrs. Wm. Holmes, Marion.....	Best tomato catsup.....	2 00
Mrs. John Boyer, Circleville.....	2d best	1 00
Mrs. N. E. Lovejoy, Columbus.....	Best cucumber catsup.....	2 00
Mary J. Smith, Lindonville.....	2d best	1 00
Mrs. N. E. Lovejoy, Columbus.....	Best pickled cucumbers.....	2 00
Mrs. L. Trimble, Marion.....	2d best	1 00
Mrs. John Boyer, Circleville.....	Best pickled peaches.....	2 00
Mrs. N. E. Lovejoy, Columbus.....	2d best	1 00
Mrs. T. Pool, Reynoldsburg.....	Best pickled tomatoes.....	2 00
Mrs. L. Trimble, Marion.....	2d best	1 00
same.....	Best pickled walnuts.....	2 00
Mary B. Taggart, Lewis Center.....	2d best	1 00
Mrs. L. Trimble, Marion.....	Best pickled butternuts.....	2 00
Mrs. N. E. Lovejoy, Columbus.....	2d best	1 00
Mrs. John Boyer, Circleville.....	Best pickled mangoes.....	2 00
Mrs. L. Trimble, Marion.....	2d best	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	Best pickled melons.....	2 00
Mrs. S. W. Park, Hope.....	2d best	1 00
Mrs. T. Pool, Reynoldsburg.....	Best pickled onions.....	2 00
Mrs. Mary Maxwell, Reynoldsburg.....	2d best	1 00
Mrs. T. Pool, Reynoldsburg.....	Best pickled gherkins.....	2 00
Mrs. John Boyer, Circleville.....	2d best	1 00
Mrs. L. Trimble, Marion.....	Best specimen concentrated vegetables.....	2 00

PRESERVES, PICKLES, ETC.—Continued.

Name and address.	Name of article.	Premium.
Mrs. Wm. Holmes, Marlon.....	2d best specimen concentrated vegetables...	\$1 00
Mary J. Smith, Lindonville.....	Best gallon maple syrup.....	2 00
Mrs. E. G. Taggart, Lewis Center.....	2d best ".....	1 00
Mary J. Smith, Lindonville.....	Best 10 pounds maple sugar in cakes.....	2 00
Wilcox Manufacturing Co., Garrettsville.....	2d best ".....	1 00
same.....	Best 10 pounds maple sugar grained.....	2 00
Mary J. Smith, Lindonville.....	2d best ".....	1 00
Miss Nancy McBride, Pataskala.....	Best gallon sorghum syrup.....	2 00
Mrs. E. G. Taggart, Lewis Center.....	Best half gallon cider vinegar.....	2 00
H. Bushwaller, Hallsville.....	2d best ".....	1 00
same.....	Best half gallon wine vinegar.....	2 00
Earl Clickinger, Columbus.....	2d best ".....	1 00
H. Bushwaller, Hallsville.....	Best and greatest variety evaporated fruits and vegetables by farmer.....	5 00
Mrs. S. W. Park, Hope.....	2d best and greatest variety evaporated fruits and vegetables by farmer.....	3 00

Awarding Committee.—J. B. Wilson, Louisa B. Brooks, Mrs. George Nelson.

POTATOES AND OTHER ROOT PRODUCTS.

Name and address.	Name of article.	Premium.
P. McGary, Jamestown.....	Best half bushel Late Rose.....	\$2 00
J. & V. Keckley, Marysville.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best half bushel White Peach Blow.....	2 00
J. & V. Keckley, Marysville.....	Best half bushel Snow Flake.....	2 00
John H. McBride, Summit Station.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel White Elephant.....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel Early Rose.....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
same.....	Best half bushel Mammoth Pearl.....	2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel Beauty of Hebron.....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel Clark's No. 1.....	2 00
Lewis Swickard, Westerville.....	2d best ".....	1 00
John Noggle, Plymouth.....	Best half bushel White Star.....	2 00
J. & V. Keckley, Westerville.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best half bushel Chicago Market.....	2 00
John Noggle, Plymouth.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel Burbank Seedling.....	2 00
P. McGary, Jamestown.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best half bushel Davenport Seedling.....	2 00
John Noggle, Plymouth.....	2d best ".....	1 00
Lewis Swickard, Westerville.....	Best half bushel Prolific.....	2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
John Poling, Columbus.....	Best half bushel Early Rose.....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
Tussing Bros., Canal Winchester.....	Best half bushel Superior.....	2 00
Lewis Swickard, Westerville.....	2d best ".....	1 00
J. & V. Keckley, Marysville.....	Best half bushel Dunmore's Seedling.....	2 00
John Noggle, Plymouth.....	2d best ".....	1 00
Lewis Swickard, Westerville.....	Best half bushel Matchless.....	2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best half bushel any new variety originated by exhibitor.....	3 00
John Noggle, Plymouth.....	2d best half bushel any new variety originated by exhibitor.....	2 00
Tussing Bros., Canal Winchester.....	Best and largest display of Irish potatoes.....	5 00
Lewis Swickard, Westerville.....	2d best ".....	3 00
Tussing Bros., Canal Winchester.....	Best half bushel sweet potatoes.....	3 00
same.....	Best display of sweet potatoes.....	5 00
B. C. Sims, Groveport.....	2d best ".....	2 00
Whipps Bros., Marion.....	Best twelve parsnips.....	2 00
same.....	Best twelve carrots.....	2 00

POTATOES AND OTHER RCOT PRODUCTS—Continued.

Name and address.	Name of article.	Premium.
Jacob Lewis, Columbus	2d best twelve parsnips.....	\$1 00
Tussing Bros., Canal Winchester	“ “ car-ots	1 00
J. G. Swicker, Circleville.....	Best six long beets (blood)	2 00
Whipps Bros., Marion	2d best “	1 00
Tussing Bros., Canal Winchester.....	Best six turnip beets.....	2 00
Robert Raisin, Columbus	2d best “	1 00
same	Best six mangel wurzels	2 00
W. B. Ford, Westerville	2d best “	1 00
Lewis Swickard, Westerville	Best display of beets, variety and quality ...	3 00
Whipps Bros., Marion	2d best “	1 00
same	Best twelve turnips for table use.....	2 00
same	2d best “	1 00
same	Best peck red onions.....	2 00
P. McGary, Jamestown.....	2d best “	1 00
same	Best peck white onions.....	2 00
J. & V. Keckley, Marysville	2d best “	1 00
W. H. Ortman, Hallsville	2d best peck of potato onions	1 00
Tussing Bros., Canal Winchester.....	Best display onions in variety and quality...	3 00
Jno. Noggle, Plymouth.....	2d best “	1 00

Awarding Committee.—B. W. Griswold, B. F. Harvelly, E. W. Brown.

VEGETABLES.

Name and address.	Name of article.	Premium.
Henry Lowry, Columbus.....	Best peck red tomatoes.....	\$2 00
A. W. Livingston & Sons, Columbus.....	2d best “	1 00
Lewis Swickard, Westerville.....	Best peck purple tomatoes	2 00
A. W. Livingston & Sons, Columbus.....	2d best “	1 00
same	Best display tomatoes in variety and quality	3 00
Whipps Bros., Marion	2d best “	2 00
Jno. Noggle, Plymouth.....	Best 6 drumhead cabbage	2 00
Robert Raisin, Columbus	2d best “	1 00
same	Best 6 head flat Dutch cabbage	2 00
Jno. Noggle, Plymouth.....	2d best “	1 00
Tussing Bros., Canal Winchester.....	Best 6 head any early variety	2 00
Robert Raisin, Columbus	2d best “	1 00
Jno. Noggle, Plymouth	Best 6 head any late variety	2 00
Jacob Lewis, Columbus	2d best “	1 00
same	Best 3 head cauliflower	2 00
Robert Raisin, Columbus	2d best “	1 00
Jacob Lewis, Columbus.....	Best half peck peppers for pickling.....	2 00
A. W. Livingston & Sons, Columbus	2d best “	1 00
B. C. Sims, Groveport.....	Best display of peppers in variety and qual.	2 00
A. W. Livingston & Sons, Columbus.....	2d best “	1 00
Whipps Bros., Marion	Best 6 stalks celery.....	2 00
same	2d best “	1 00
same	Best 3 marrow squashes	2 00
P. McGary, Jamestown.....	2d best “	1 00
A. W. Livingston & Sons, Columbus.....	Best 3 Hubbard squashes.....	2 00
Whipps Bros., Marion	2d best “	1 00
W. H. Ortman, Hallsville	Best 3 winter crookneck squashes.....	2 00
Tussing Bros., Canal Winchester.....	2d best “	1 00
same	Best French Squash.....	2 00
A. W. Livingston & Sons, Columbus	2d best “	1 00
Tussing Bros., Canal Winchester.....	Best summer squash.....	2 00
George Kroninger, Columbus.....	2d best “	1 00
P. McGary, Jamestown.....	Best display squashes.....	5 00
Tussing Bros., Canal Winchester.....	2d best “	2 00
A. W. Livingston & Sons, Columbus	Best display 6 pumpkins	2 00
Tussing Bros., Canal Winchester.....	2d best “	1 00
same	Best display pumpkins	3 00
A. W. Livingston & Sons, Columbus	2d best “	1 00
Whipps Bros., Marion	Best dozen sweet corn, early.....	2 00
J. & V. Keckley, Marysville.....	2d best “ “	1 00
W. H. Hendron, Groveport.....	Best “ “ late	2 00
Fred. Charles, Columbus	2d best “ “	1 00

VEGETABLES—Continued.

Name and address.	Name of article.	Premium.
A. W. Livingston & Sons, Columbus.....	Best 3 gypsy watermelons.....	\$2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best 3 ice cream watermelons.....	2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best 3 of any other variety.....	2 00
A. W. Livingston & Sons, Columbus.....	2d best ".....	2 00
Tussing Bros., Canal Winchester.....	Best 3 green flesh muskmelons.....	2 00
same.....	" yellow ".....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
Tussing Bros., Canal Winchester.....	Best 3 nutmeg melons.....	2 00
same.....	Best and greatest display melons, all varieties.....	5 00
A. W. Livingston & Sons, Columbus.....	2d best ".....	2 00
Tussing Bros., Canal Winchester.....	Best display late cucumbers.....	2 00
Whipps Bros., Marion.....	2d best ".....	1 00
Henry Lowry, Columbus.....	Best half peck Lima beans, green, in pod.....	2 00
Tussing Bros., Canal Winchester.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best kidney bush beans, green, in pod.....	1 00
J. & V. Keckley, Marysville.....	2d best ".....	1 00
Tussing Bros., Canal Winchester.....	Best half peck any other var., green, in pod.....	2 00
J. & V. Keckley, Marysville.....	2d best ".....	1 00
Whipps Bros., Marion.....	Best and greatest variety garden beans.....	3 00
John Noggle, Plymouth.....	2d best ".....	1 00
A. W. Livingston & Sons, Columbus.....	Best half peck garden peas.....	2 00
Jacob Lewis, Columbus.....	Best 3 purple egg plants.....	2 00
A. W. Livingston & Sons, Columbus.....	2d best ".....	1 00
Tussing Bros., Canal Winchester.....	Best and greatest variety of vegetables raised by one exhibitor.....	10 00
Whipps Bros., Marion.....	2d best ".....	5 00

BEES, HONEY, AND APIARIAN SUPPLIES.

Name and address.	Name of article.	Premium.
Brigham & Clayburg, New London.....	Best crate or case comb honey.....	\$8 00
A. S. Goodrich, Worthington.....	2d best ".....	3 00
same.....	Best display of honey, marketable shape.....	12 00
C. E. Jones, Delaware.....	2d best ".....	6 00
Dr. Bessie, Delaware.....	Best display ext'd honey, marketable shape.....	5 00
A. S. Goodrich, Worthington.....	2d best ".....	3 00
same.....	Best general dis. comb and ext'd honey, 1885.....	10 00
C. E. Jones, Delaware.....	2d best ".....	5 00
same.....	Best manipulation full hive bees.....	8 00
Earl Clickinger, Columbus.....	Best nucleus of Italian bees.....	5 00
A. Benedict, Bennington.....	2d best ".....	3 00
same.....	Best display of queen bees.....	3 00
Jennie Culp, Hilliard.....	Best sample of beeswax—3 lbs., not less.....	2 00
J. W. Newlove, Columbus.....	Best essay on the protection of comb and extracted honey, including management, etc.....	5 00
C. E. Jones, Delaware.....	Best sample of comb-foundation for brood-chambers.....	2 00
same.....	Best sample of comb-foundation for surplus honey.....	2 00
Dr. Bessie, Delaware.....	Best comb-foundation mill.....	3 00
same.....	Best beeswax extractor.....	2 00
Earl Clickinger, Columbus.....	Best bee smoker.....	2 00
same.....	Best uncapping knife.....	1 00
J. W. Newlove, Columbus.....	Best bee veil.....	1 00
same.....	Best bee feeder.....	2 00
Earl Clickinger, Columbus.....	2d best ".....	1 00
J. W. Newlove, Columbus.....	Best honey extractor.....	2 00
Dr. Bessie, Delaware.....	2d best ".....	1 00
same.....	Best shipping case or crate for comb-honey.....	2 00
Earl Clickinger, Columbus.....	2d best ".....	1 00
J. W. Newlove.....	Best general purpose bee hive.....	3 00
Earl Clickinger, ".....	2d best ".....	2 00
J. W. Newlove, ".....	Best arrangement for absorb'g moisture, etc.....	2 00
Dr. Bessie, Delaware.....	2d best ".....	1 00

HORTICULTURAL PRODUCTS.

SUMMER AND FALL APPLES.

Name and address.	Name of article.	Premium.
Wm. H. West, Chillicothe.....	Best six varieties	\$5 00
Daniel Duer, Millersburg	2d best "	3 00
Nelson Dresback, Hallsville	Best three varieties.....	3 00
Daniel Duer, Millersburg	2d best "	2 00
Hurst & Hurst, Chillicothe.....	Best approved new variety	2 00
A. Webster, Clintonville.....	2d best "	1 00
W. H. West, Chillicothe	Best three varieties of large	3 00
Daniel Duer, Millersburg	2d best "	2 00
same	Best three varieties of market	3 00
Hurst & Hurst, Chillicothe	2d best "	2 00
Miss Lizzie Hurst, Chillicothe	Best variety of summer dessert	2 00
W. H. West, Chillicothe	2d best "	1 00
I. Freeman, Rex	Best variety of fall dessert	2 00
Miss Lizzie Hurst, Chillicothe	2d best "	1 00
Wm. H. West, Chillicothe	Best half-bushel basket, six varieties	5 00
Hurst & Hurst, Chillicothe.....	2d best "	3 00
Daniel Duer, Millersburg	Best display fifteen varieties	10 00
Hurst & Hurst, Chillicothe.....	2d best "	5 00

Awarding Committee.—S. W. Brown, J. P. Streeper, John Poste.

WINTER APPLES.

Name and address.	Name of article.	Premium.
Hurst & Hurst, Chillicothe.....	Best ten varieties.....	\$10 00
Nelson Cox, Bradrick	2d best "	5 00
W. Oliver, Kingston	Best five varieties	5 00
Daniel Duer, Millersburg	2d best "	3 00
Nelson Cox, Bradrick	Best five plates of large.....	5 00
Hurst & Hurst, Chillicothe	2d best "	2 00
I. Freeman, Rex	Best variety of dessert	2 00
Daniel Duer, Millersburg	2d best "	1 00
W. H. Hendron, Groveport	Best approved new variety.....	3 00
Hurst & Hurst, Chillicothe.....	2d best "	1 00
Nelson Cox, Bradrick	Best six varieties for market.....	5 00
Nelson Dresback, Hallsville.....	2d best "	3 00
Hurst & Hurst, Chillicothe.....	Best half-bushel basket, ten varieties.....	5 00
Daniel Duer, Millersburg	2d best "	3 00
Nelson Dresback, Hallsville.....	Best display of thirty varieties	15 00
Daniel Duer, Millersburg	2d best "	8 00

Awarding Committee.—John Poste, S. W. Brown, J. P. Streeper.

PLATE APPLES.

Name and address.	Name of article.	Premium.
Hurst & Hurst, Chillicothe.....	Best American Summer Pearmain	\$2 00
Daniel Duer, Millersburg	" Baldwin.....	2 00
W. Oliver, Kingston.....	" Bellflower.....	2 00
Daniel Duer, Millersburg	" Belmont.....	00
Hurst & Hurst, Chillicothe.....	" Ben Davis.....	00
same.....	" Ortle.....	00
same.....	" Hawley.....	00
Daniel Duer, Millersburg	" Clermont.....	00
N. Dresbach, Hallsville.....	" Fall Pippin.....	00
same.....	" Fallwater.....	00
Hurst & Hurst, Chillicothe.....	" Fall Wine.....	00
Daniel Duer, Millersburg	" Gravenstein.....	00
same.....	" Grimes' Golden	00
same.....	" Hubbardson Nonsuch.....	2 00
Hurst & Hurst, Chillicothe.....	" Jonathan.....	2 00
same.....	" King of Tompkins County	2 00
N. Dresbach, Hallsville.....	" Northern Spy.....	2 00
S. J. Wooley, Hilliard.....	" Ohio Nonpareil.....	2 00
N. Dresbach, Hallsville.....	" Peck's Pleasant	2 00
J. St. John, Lebanon.....	" Porter.....	2 00
S. H. Hurst, Chillicothe.....	" Rambo.....	2 00
Daniel Duer, Millersburg	" Red Canada.....	2 00
N. Dresbach, Hallsville.....	" Rhode Island Greening	2 00
David Jones, Hallsville.....	" Western Beauty.....	2 00
Nelson Cox, Bradrick.....	" Rome Beauty.....	3 00
Hurst & Hurst, Chillicothe.....	" Roxbury Russet	2 00
Nelson Cox, Bradrick.....	" Smith's Cider.....	2 00
J. M. Miller, Columbus.....	" Twenty Ounce.....	2 00
Hurst & Hurst, Chillicothe.....	" White Pippin.....	2 00
same.....	" Stark.....	2 00
Daniel Duer, Millersburg.....	" Benoni.....	2 00
Hurst & Hurst, Chillicothe.....	" Wagner.....	2 00
S. H. Hurst, Chillicothe.....	" Newton Spitzenburg.....	2 00
Hurst & Hurst, Chillicothe	" Maiden Blush.....	2 00
same.....	" Early Harvest.....	2 00
same.....	" Golden Russet (American).....	2 00
same.....	" Limber Twig.....	2 00
W. West, Chillicothe.....	" Paradise Winter Sweet.....	2 00
W. H. West, Chillicothe.....	" Smoke House.....	2 00
A. Oliver, Kingston.....	" Fink.....	2 00
S. H. Hurst, Chillicothe.....	" Wine Sap.....	2 00
Daniel Duer, Millersburg.....	" Roman Stem.....	2 00
Hurst & Hurst, Chillicothe.....	" Newtown Pippin.....	2 00
Nelson Cox, Bradrick.....	" Gilliflower, Black.....	2 00
Daniel Duer, Millersburg	" Willow Twig.....	2 00
N. Dresbach, Hallsville.....	" Penn. Red Streak.....	2 00
Daniel Duer, Millersburg	" Lady Apple.....	2 00
W. H. West, Chillicothe.....	" Milan.....	2 00
S. H. Hurst, Chillicothe.....	" Famous.....	2 00
H. Bookwalter, Hallsville.....	" Chenango Strawberry.....	2 00
S. J. Wooley, Hilliard.....	" English Russet.....	2 00
Daniel Duer, Millersburg	" Powell.....	2 00
Wm. H. West, Chillicothe.....	" Rawles Janet.....	2 00
N. Dresbach, Hallsville.....	" Seek-No-Further.....	2 00
Daniel Duer, Millersburg	" Summer Queen.....	2 00

Awarding Committee.—F. R. Palmer, M. E. Dresbach, L. B. Pierce.

CRAB APPLES.

Name and address.	Name of article.	Premium.
Daniel Duer, Millersburg.....	Best plate of Transcendent.....	\$2 00
Mrs. S. J. Wooley, Hilliard.....	" " Yellow Siberian.....	2 00
Daniel Duer, Millersburg.....	" " Hughes' Virginia.....	2 00

Awarding Committee.—F. R. Palmer, M. E. Dresbach, L. B. Pierce.

PEACHES, QUINCES, AND PLUMS.

Name and address.	Name of article.	Premium.
PEACHES.		
G. E. Davis, Preston, Md	Best 6 varieties	\$5 00
same	" 3 "	2 00
Hurst & Hurst, Chillicothe	2d "	1 00
Nelson Cox, Bradrick	Best plate one variety	2 00
same	Best plate new seedling	2 00
M. Lawrence, Columbus	2d best "	1 00
Nelson Cox, Bradrick	Best Cling	2 00
Wm. H. West, Chillicothe	" Stump the World	2 00
Hurst & Hurst, "	" Smock	2 00
same	" Ward's Slate	2 00
same	" La Grange	2 00
Wm. H. West, Chillicothe	Heath Cling	2 00
Hurst & Hurst, Chillicothe	Pride of Essex	2 00
M. Lawrence, Columbus	Red Checkered Melocothon	2 00
QUINCES.		
Daniel Duer, Millersburg	Best plate of orange quinces	2 00
Nelson Cox, Bradrick	" pear quinces	2 00
Daniel Duer, Millersburg	" Champion quinces	2 00
Nelson Cox, Bradrick	Best peck quinces	3 00
PLUMS.		
S. H. Hurst, Chillicothe	Best display of 10 varieties	5 00
Hurst & Hurst, "	2d "	3 00
S. H. Hurst, "	Best 5 varieties	3 00
Hurst & Hurst, "	2d "	2 00
S. H. Hurst, "	Best 3 varieties	2 00
Hurst & Hurst, "	2d "	1 00
S. H. Hurst, "	Best plate of Lombard	2 00
same "	Imperial Gage	2 00
same "	Pond's Seedling	2 00
Wm. H. West, "	any other variety	2 00
S. H. Hurst, "	Long Scarlet	2 00
Wm. H. West, "	Shropshire	2 00

Awarding Committee.—Fedor Weltz, George M. High, W. W. Farnsworth.

PEARS.

Name and address.	Name of article.	Premium.
I. Freeman Rex	Best 6 varieties of summer and fall	\$8 00
C. A. Powers, Perrysburg	2d "	5 00
I. Freeman, Rex	Best 12 varieties of summer, fall, and winter	10 00
N. Ohmer, Dayton	2d "	5 00
J. Linxweller, Dayton	Best 3 plates of large	3 00
Nelson Cox, Bradrick	2d "	2 00
N. Ohmer, Dayton	Best 6 varieties of market	6 00
C. A. Powers, Perrysburg	2d "	3 00
J. P. Streeper, Chillicothe	Best new variety	3 00
Hurst & Hurst, Chillicothe	Best variety of dessert	2 00
C. A. Powers, Perrysburg	Best display 20 varieties	15 00
I. Freeman, Rex	2d best	8 00
Nelson Cox, Bradrick	Best half peck Seckel	3 00
B. E. Post, Columbus	2d "	2 00
Nelson Cox, Bradrick	Best half peck Bartlett	3 00
John Post, Columbus	Best plate of Bartlett	2 00
I. Freeman, Rex	" Belle Lucrative	2 00
S. Irons, Lebanon	" Beurre Bosc	2 00
Nelson Cox, Bradrick	" Beurre Clairgeau	2 00
S. Irons, Lebanon	" Beurre d'Anjou	2 00
C. A. Powers, Perrysburg	" Beurre Diel	2 00
Daniel Duer, Millersburg	" Clapp's Favorite	2 00
C. A. Powers, Perrysburg	" Columbia	2 00
Gottlieb Long, Chillicothe	" Doyenne Boussock	2 00
S. Irons, Lebanon	" Duchesse d'Angouleme	2 00
Frederick Brant, Chillicothe	" Flemish Beauty	2 00

PEARS.—Continued.

Name and address.	Name of article.	Premium.
John Post, Columbus	Best plate of Howell.....	\$2 00
Mrs. Alex. Renick.....	" Sheldon.....	2 00
John Post, Columbus	" Lawrence.....	2 00
same.....	" Louise Bonne de Jersey.....	2 00
I. Freeman, Rex.....	" Onondaga.....	2 00
Nelson Cox, Bradrick.....	" Seckel.....	2 00
A. Stubs, Lebanon.....	" Vicar of Winkfield.....	2 00
Daniel Duer, Millersburg.....	" Kieffer.....	2 00
J. P. Streeper, Chillicothe.....	" Bufum.....	2 00

Awarding Committee.—W. W. Farnsworth, H. Wilson, Geo. W. Campbell.

GRAPES—HARDY.

Name and address.	Name of article.	Premium.
Jacob Linxweiler.....	Best 20 varieties.....	\$15 00
Geo. W. Campbell, Delaware.....	2d ".....	10 00
Wm. H. West, Chillicothe.....	Best 10 varieties.....	10 00
Jacob Linxweiler, Dayton.....	2d ".....	5 00
Wm. H. West, Chillicothe.....	Best 6 varieties.....	6 00
John S. Snyder, Lancaster.....	2d ".....	3 00
Wm. H. West, Chillicothe.....	Best 3 varieties.....	3 00
John S. Snyder, Lancaster.....	2d ".....	2 00
M. Witt, Columbus.....	Best new and valuable seedling.....	3 00
John Pfiffer, Delaware.....	Best 3 plates early table grapes.....	3 00
Wm. H. West, Chillicothe.....	" late grapes.....	3 00
J. Linxweiler, Dayton.....	" grapes for red wine.....	3 00
John S. Snyder, Lancaster.....	" grapes for white wine.....	3 00
Wm. H. West, Chillicothe.....	Best plate of Catabwa.....	2 00
Van Burton, Lancaster.....	" Concord.....	2 00
August Pot, Dayton.....	" Delaware.....	2 00
Wm. H. West, Chillicothe.....	" Ives.....	2 00
John S. Snyder, Lancaster.....	" Lady.....	2 00
J. Linxweiler, Dayton.....	" Martha.....	2 00
Wm. H. West, Chillicothe.....	" Norton's Virginie.....	2 00
J. Linxweiler, Dayton.....	" Salem.....	2 00
John Snyder, Lancaster.....	" Wilder.....	2 00
Geo. Campbell, Delaware.....	" Brighton.....	2 00
same.....	" Moore's Early.....	2 00
J. Linxweiler, Dayton.....	" Jefferson.....	2 00
Jos. Kratochwill, Dayton.....	" Pocklington.....	2 00
same.....	" Lady Washington.....	2 00
Geo. Campbell, Delaware.....	" Early Victor.....	2 00
John S. Snyder, Lancaster.....	" Missouri Rusling.....	2 00
same.....	" Elvira.....	2 00
Geo. Campbell, Delaware.....	" Vergennes.....	2 00
same.....	" Duchess.....	2 00

Awarding Committee.—George M. High, John Poste, W. W. Farnsworth.

COUNTY FRUITS.

Name and address.	Name of article.	Premium.
Daniel Duer, Millersburg, Holmes Co.	Best collection from any Co. in Ohio....	Dip. & \$40 00
West & Dresbach, Chillicothe, Ross Co....	2d " " " ".....	20 00

Awarding Committee.—N. Ohmer, Geo. W. Campbell, Horace Wilson, G. S. Innis, S. Irons.

FLOWERS AND PLANTS—PROFESSIONAL LIST.

Name and address.	Name of article.	Premium.
Maurice Evans, Columbus.....	Best col'n of plants and finest arrangement..	\$20 00
J. F. Sked, Westerville.....	2d best " " " " " "	10 00
Maurice Evans, Columbus.....	Best single specimen plant.....	5 00
same	Best collection of palms.....	15 00
same	Best single specimen plant.....	5 00
same	Best collection of ferns.....	15 00
same	Best single specimen plant.....	5 00
same	Best collection variegated plants.....	15 00
J. F. Sked, Westerville.....	2d best " " " " " "	10 00
same	Best single specimen plant.....	3 00
Maurice Evans, Columbus.....	Best collection of begonias.....	8 00
J. F. Sked, Westerville.....	2d best " " " " " "	5 00
Maurice Evans, Columbus.....	Best single specimen plant.....	2 00
J. F. Sked, Westerville.....	Best collection of cannas.....	5 00
same	Best collection of ornamental grasses.....	5 00
Maurice Evans, Columbus.....	Best single specimen plant.....	2 00
J. F. Sked, Westerville.....	Best collection of evergreens.....	15 00
Maurice Evans, Columbus.....	2d best " " " " " "	8 00
J. F. Sked, Westerville.....	Best single specimen plant.....	5 00
same	Best collection of plants on trellis work.....	5 00
Maurice Evans, Columbus.....	Best single specimen plant.....	3 00
J. F. Sked, Westerville.....	Best collection of aloes.....	3 00
same	Best single specimen plant.....	1 00
same	Best collection of fancy caladiums.....	8 00
same	Best single specimen plant.....	2 00
same	Best collection of new plants.....	10 00
Maurice Evans, Columbus.....	Best collection of cactus.....	5 00
same	Best single specimen plant.....	3 00
same	" " " " " "	2 00
same	Best collection of roses.....	10 00
same	Best single specimen plant.....	3 00
same	Best collection of verbenas.....	5 00
J. F. Sked, Westerville.....	Best arch of living plants.....	5 00
Maurice Evans, Columbus.....	Best ribbon-bed of living plants.....	5 00
J. F. Sked, Westerville.....	2d best " " " " " "	3 00
Maurice Evans, Columbus.....	Best pair of vases living plants.....	5 00
same	Best six hanging baskets of living plants.....	5 00
J. F. Sked, Westerville.....	Best piece of rustic work.....	5 00
CUT FLOWERS.		
Maurice Evans, Columbus.....	Best pair hand bouquets.....	5 00
Mrs. C. A. Huber, Circleville.....	2d best " " " " " "	3 00
Maurice Evans, Columbus.....	Best pair parlor bouquets (15 inches).....	5 00
Mrs. C. A. Huber, Circleville.....	2d best " " " " " "	3 00
Maurice Evans, Columbus.....	Best dish of floral designs.....	20 00
Mrs. C. A. Huber, Circleville.....	2d best " " " " " "	15 00
Maurice Evans, Columbus.....	Best display of cut roses.....	5 00
J. F. Sked, Westerville.....	" " " " dahlias.....	5 00
same	" " " " gladiolus.....	5 00
Maurice Evans, Columbus.....	" " " " verbenas.....	5 00
J. F. Sked, Westerville.....	" " " " phloxes.....	5 00
Maurice Evans, Columbus.....	Best display cut flowers.....	15 00
J. F. Sked, Westerville.....	2d best " " " " " "	8 00
Wm. Halley, Columbus.....	Best aquarium.....	10 00

Awarding Committee.—Fedor Weltz, Wm. McKellar, S. D. Blar.

FLOWERS AND PLANTS—AMATEUR LIST.

Name and address.	Name of article.	Premium.
Mrs. N. E. Lovejoy, Columbus.....	Best collection, 12 varieties.....	\$8 00
Mrs. W. R. Sprague, Brice.....	Best specimen plant in or out of bloom.....	5 00
Miss Bell McClelland, Columbus.....	Best collection of coleus, 10 varieties.....	5 00
same	Best 6 specimens of coleus.....	3 00
Mrs. J. W. Baker, Columbus.....	Best specimen begonias.....	3 00
Miss Addie Pugh, Columbus.....	Best collection aloes and cactus in pots.....	00

PLANTS AND FLOWERS—AMATEUR LIST—Continued.

Name and address.	Name of article.	Premium.
Miss Addie Pugh, Columbus	Best specimen aloes	\$2 00
C. M. Morrison, Taylor	“ cactus	2 00
Mrs. N. E. Lovejoy, Columbus	Best collection of geraniums	5 00
Mrs. W. R. Sprague, Brice	Best specimen of geranium	2 00
Miss Addie Pugh, Columbus	Best collection ferns and lycopodiums	5 00
Mrs. N. E. Lovejoy, Columbus	“ of roses in bloom	5 00
Mrs. W. R. Sprague, Brice	“ of plants on trellis	5 00
Miss Addie Pugh, Columbus	Best six hanging baskets of living plants	5 00
Mrs. W. F. Barr, Brice	2d best “ “	3 00
Mrs. W. R. Sprague, Brice	Best single rustic basket	3 00
CUT FLOWERS.		
Miss Jennie Cerder, Maryville	Best table designs of cut flowers	8 00
Miss Emma Aldons, Columbus	2d best “ “	5 00
Stephen Cook, Blendon	Best collection of dahlias	5 00
Mrs. A. L. Perry, Lewis Center	2d best “ “	3 00
Mrs. N. E. Lovejoy, Columbus	Best “ roses	3 00
Mrs. J. Zirkle, Columbus	“ verbenas	3 00
Stephen Cook, Blendon	“ phloxes	2 00
Miss Jennie Cerder, Marysville	Best display of asters	2 00
Miss Anna Loffland, Columbus	“ balsams	2 00
Mrs. H. Bieber, Delaware	“ pansies	2 00
Mrs. N. E. Lovejoy, Columbus	“ geraniums	2 00
Mrs. H. Bieber, Delaware	“ coxcombs and aramanths	2 00
same	“ double zinnias	2 00
Mrs. J. Zirkle, Columbus	“ cut flowers	5 00
Miss Anna Loffland, Columbus	2d best “ “	3 00
Miss Jennie Cerder, Marysville	Best “ parlor bouquets	2 00
Mrs. J. Zirkle, Columbus	Best collection of native flowers	3 00
Mrs. M. F. Williams, Columbus	2d best “ “	2 00

Awarding Committee.—Mrs. P. Bennett, Mrs. J. W. Robinson, Miss M. E. Senally.

MACHINERY AND IMPLEMENTS.

MACHINERY, ENGINES, ETC.

Name and address.	Name of article.	Premium.
Chandler & Taylor, Indianapolis, Ind.	Best stationary engine	S. M.
Royce & Pulling, Columbus	2d best “ “	Dip.
same	Best steam pump	Dip.

Awarding Committee.—John Blair, W. F. H. Penington, F. E. Weldon.

SHOP AND MISCELLANEOUS MACHINERY, TOOLS, ETC.

Name and address.	Name of article.	Premium.
A. F. & M. Works, Anderson, Ind.	Best tile machine	Sil. M.
Royce & Pulling, Columbus	" turning lathe	"
same	" forge blower	"
Mast, Foos & Co., Springfield	" ornamental fence	"
E. Williamson, Covington, Ohio	" portable fence	"
M. D. Cummings, Hope	" iron fence, including posts	"
Columbus Combination Fence Co.	" farm fence, including posts	"
Hannika Iron Fence Co., Springfield.	" farm gate	"
same	" automatic gate	"
Dun Bros., Dublin	" fruit and vegetable dryer	"
H. Bookwalter, Hallsville	" grain register	"
F. E. Myers & Bro., Ashland	" well pump	"

Awarding Committee.—John Blair, W. F. H. Pennington, F. E. Weldon.

MECHANICS' AND MANUFACTURERS' PRODUCTS—WORKED METALS.

Name and address.	Name of article.	Premium.
Wm. Burdell, Jr., Columbus.	Best display of hames	\$3 00
same	" saddle trees	2 00
same	" saddler's hardware	5 00
T. J. Thomas, Springfield	" horse shoes and nails	3 00
Wm. Halley, Columbus	" plumbers' goods and wares	5 00
Blackwood, Green & Co., Columbus	" Britannia and Japan ware	5 00
same	" kitchen utensils of B. & C.	5 00
same	" copper w ^k other than above	5 00
Halm & Bellows Furniture Co., Columbus ..	" brass	5 00
Miller & Bradley, Columbus	" kitchen utensils of tin	5 00
James Ohlen & Sons, Columbus	" circular and mill saws	3 00
same	" cross-cut and hand-saws	5 00
National Sheet & Metal Roofing Co., N.Y. ..	" roofing	5 00

Awarding Committee.—S. S. Mathers, Morris Hagerty, Z. T. Duer.

STOVES, CASTINGS, MARBLEIZING, ETC.

Name and address.	Name of article.	Premium.
C. Emrich, Columbus	Best cooking stove for wood	Sil. M.
Blackwood, Green & Co., Columbus	" " price considered	"
same	" " coal	"
same	" "	"
C. Emrich, Columbus	" parlor stove, retail price considered	"
Blackwood, Green & Co., Columbus	" display of stoves	\$20 00
Brice Furnace Co., Dayton	" furnace for heating dwellings	Sil. M.
Miller & Bradley, Columbus	" base burner for hard coal	"
same	" cooking range	"
Capital City Mantel Works, Columbus	" parlor grate with summer front	Dip.
G. Schreyer, Columbus	" school-house stove	Sil. M.
Miller & Bradley, Columbus	" display of granite and marbleized ware	"

Awarding Committee.—S. S. Mathers, J. F. Doty, John Blair.

VEHICLES.

Name and address.	Name of article.	Premium.
John Immel & Son, Columbus.....	Best and handsomest barouche or coach.....	\$25 00
Buckeye Buggy Co., Columbus.....	" " 2-horse family carriage.....	20 00
John Immel & Son, Columbus.....	" " 1-horse ".....	15 00
M. & E. H. Hayes, Columbus.....	Best top buggy.....	10 00
same.....	" open buggy.....	10 00
John Immel & Son, Columbus.....	" pony phaeton.....	5 00
McMurray & Fisher, Columbus.....	" sulkey.....	5 00
same.....	" trotting wagon.....	5 00
Doty, Sacket & Co., Delaware.....	" farm wagon.....	10 00
Benns & Grimm, Columbus.....	" spring market wagon.....	5 00
same.....	" city express wagon.....	5 00
John Immel & Son, Columbus.....	" covered spring delivery wagon.....	5 00
Kemp & Burpee, Syracuse, N. Y.....	" wheelbarrow.....	Dip.
Turnbull Wagon Co., Defiance.....	" wagon or carriage brake.....	Dip.
H. Heckman, Elmore.....	" spring seat.....	Dip.
Mithoff, Evans & Co., Columbus.....	" display carriage or cabs for children.....	5 00
John Immel & Son, Columbus.....	" " wheels, hubs, etc.....	5 00
same.....	" bent work for carriages.....	5 00
same.....	" dis. iron axles for carriages and wagons.....	5 00
same.....	" display of carriage springs.....	5 00
Schrock & McDonald, Columbus.....	" three-horse everer.....	2 00
F. R. Wilson & Son, Columbus.....	" display double and single trees.....	3 00
John Immel & Son, Columbus.....	" " carles and buggies by manufac.....	Dip.

Awarding Committee.—A. J. Clisba, S. S. Mathers, C. F. Kanaurs, George D. Neal.

LEATHER MANUFACTURES.

Name and address.	Name of article.	Premium.
William Burdell, Jr.....	Best set carriage or coach harness.....	\$5 00
same.....	" light double harness.....	5 00
same.....	" single heavy harness.....	3 00
same.....	" light harness.....	5 00
same.....	" double harness, farm use.....	5 00
same.....	" " wagon use.....	5 00
same.....	Best light harness collar.....	1 00
same.....	" draft.....	1 00
same.....	" display of halters.....	3 00
same.....	" riding bridle.....	1 00
same.....	" man's saddle.....	3 00
same.....	" lady's saddle.....	3 00
same.....	" display of saddlery and harness.....	Dip.
American Whip Co., Westfield, Mass.....	" " carriage, buggy and W. whips.....	3 00

Awarding Committee.—J. D. Kinsawell, Ira S. Read, Howard Booth.

HOUSEHOLD IMPLEMENTS, WOODEN WARE, ETC.

Name and address.	Name of article.	Premium.
A. L. Yardley, Columbus.....	Best display of cedar ware.....	\$3 00
same.....	" pine ware.....	3 00
same.....	" oak ware.....	3 00
same.....	" willow ware.....	3 00
same.....	" osier ware.....	3 00
same.....	" split wood basket.....	3 00

HOUSEHOLD IMPLEMENTS, ETC.—Continued.

Name and address.	Name of article.	Premium.
A. L. Yardley, Columbus	Best display of grain measures.....	\$1 00
A. Teachout & Co., Columbus	" " pine, oak, or walnut doors	5 00
same	" " window blinds	3 00
A. L. Yardley, Columbus	" " turning lathe work	3 00
John E. Hussey, Columbus	" bracket	1 00
A. Teachout & Co., Columbus	" fly-screens for windows or doors.....	3 00
A. L. Yardley, Columbus	" collection of screen work.....	5 00
same	" wire flower stand	3 00
Jno. Frank, Columbus	" collection of scroll saw work.....	5 00
Keiser & Hanna, Columbus	" improved kitchen safe.....	3 00
A. L. Yardley, Columbus	" device for hanging or adjusting screen doors	Dip.
same	" fruit and step ladder.....	2 00
same	" extension ladder	2 00
J. N. Wilson, N. Fairfield	" churn	3 00
Dun Bros., Dublin.....	" butter worker.....	3 00
same	" butter packer.....	3 00
A. A. Fradenburg, Port Washington.....	" apple parer	1 00
F. Buck & Son, Columbus	" dozen corn brooms.....	2 00
A. L. Yardley, Columbus	" half-dozen wash-boards	2 00
same	" washing machine.....	3 00
same	" clothes wringer	2 00
same	" mangle or ironing machine.....	2 00
A. A. Fradenburg, Port Washington.....	" clothes-horse, to occupy least space	3 00
Dun Bros., Dublin.....	" creamer for dairy use.....	Dip.

Awarding Committee.—Albert Cooper, L. A. Baughman, Henry Hekman.

GLASS, CROCKERY, STONEWARE, BRICKS AND TILES.

Name and address.	Name of article.	Premium.
Haydenville M. & Mfg. Co., Haydenville.....	Best terra cotta.....	\$3 00
A. O. Jones & Co., Columbus	" display of drain tile	Dip. & 5 00
Haydenville M. & Mfg. Co., Haydenville.....	" Ohio fire clay.....	3 00

Awarding Committee.—L. A. Dackman, Ed. Orton, Jr., O. K. Ellis, Nat. Brooks.

MINERALS AND CHEMICALS.

Name and address.	Name of article.	Premium.
Thos. Bushnell, Hayesville.....	Best collection Ohio woods.....	Silver med.
J. & V. Keckley, Marysville.....	" " foreign woods.....	\$5 00
S. E. Massart, Columbus	" display of veneers	5 00
Thos. Bushnell, Hayesville.....	" " minerals.....	5 00
Higgin's Eureka Salt Co., Liv. and N. Y.....	" " salt.....	5 00
J. & V. Keckley, Marysville	" collection Ohio bituminous coal.....	5 00
Thos. Bushnell, Hayesville.....	" " Ohio cannel coal.....	5 00
same	" " iron ores.....	5 00
Mrs. H. Bieber, Delaware	" display of soap.....	5 00

Awarding Committee.—L. A. Dackman, Ed. Orton, Jr., O. K. Ellis, J. W. Robinson, A. D. Haskin.

TEXTILE FABRICS AND DOMESTIC MANUFACTURES.

HOUSEHOLD FABRICS.

Name and address.	Name of article.	Premium.
Miss Edie Smith, Lindenville.....	Best rag carpet, 15 or more yards.....	\$5 00
Mrs. John Boyer, Circleville	2d best " " " " " " " "	3 00
Mrs. W. R. Sprague, Brice	Best hearth rag	3 00
Miss L. A. Parsons, Galton	2d best " " " " " " " "	2 00
Mrs. L. M. C. Miner, Lithopolis.....	Best yarn rug	3 00
Miss Maggie Vogel, Attica.....	2d best " " " " " " " "	2 00
Mrs. Z. Vesey, Groveport	Best rag rug	3 60
Miss Maggie Vogel, Attica	2d best " " " " " " " "	2 00
Mrs. T. Pool, Reynoldsburg	Best 10 yards domestic flannel	3 00
Mrs. E. E. Dennis, Pataskala.....	2d best " " " " " " " "	2 00
same	Best 10 yards domestic linen.....	3 00
Mrs. E. H. Jamison, Delaware	2d best " " " " " " " "	2 90
Mrs. R. M. Johnson, Pataskala.....	Best 15 yards tow cloth.....	3 00
Mrs. E. E. Dennis, Pataskala.....	2d best " " " " " " " "	2 00
Mrs. H. Bieber, Delaware	Best pair woolen knit stockings.....	1 00
same	" pair linen knit socks	1 00
Mrs. H. Giesey, Columbus.....	" pair cotton knit stockings.....	1 00
Mrs. Kraft, Columbus	" pair silk knit socks	1 00
Mrs. Wm. Turner, North Fairfield.....	" " wristlets	1 00
Mrs. C. Koepplin, Marysville.....	" " gloves	1 00
Miss Lou Allen, North Fairfield.....	" " mittens	1 00
Miss Jessie Glenn, Columbus.....	specimen of darning.....	1 00
Mrs. Wm. Turner, North Fairfield.....	cotton knit tidy.....	1 00
Miss Addie Shufflin, Columbus.....	" lace	1 00
Miss Kittie Kalser, Chillicothe.....	woolen knit lace.....	1 00
Miss Rosie Nogle, Chicago, Ohio	" pair cotton knit socks	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	" pair woolen knit socks.....	1 00
Mrs. Ellen King, Brice.....	" " gloves	1 00
Miss Rosie Nogle, Chicago, Ohio	" " mittens	1 00
same	" pair by Misses under 12 years.....	1 00
Mrs. E. Hoke, Marion.....	" pair woolen stockings by Misses.....	1 00
Mrs. Mary Maxwell, Reynoldsburg.....	worsted knit stockings.....	1 00
Mrs. C. Koepplin, Marysville.....	woolen shawl.....	2 00
Mrs. R. M. Johnston, Pataskala	stocking yarn	1 00
Mrs. T. Pool, Reynoldsburg.....	straw hat	1 00
Mrs. E. S. Boalt, Marion	bed spread	3 00
Mrs. E. H. Jamison, Delaware	2d best " " " " " " " "	1 00
Mrs. Mellis Houston, Columbus.....	Best specimen of tatting	0 10
Mrs. R. M. Johnston, Pataskala.....	" 10 lbs. dressed flax	2 00
Mrs. E. H. Jamison, Delaware	2d best " " " " " " " "	1 00

Awarding Committee.—J. L. Hawkins, Mrs. Ellen G. Griswold, Miss M. E. Smalley.

NEEDLEWORK.

Name and address.	Name of article.	Premium.
Mrs. W. R. Sprague, Brice	Best gent's shirt, hand made.....	\$2 00
Miss Rose Nogle, Chicago, O.....	" " machine made.....	2 00
Miss Emma Miller, Xenia	" chemise	2 00
Miss Ella A. Allen, North Fairfield.....	" specimen hem stitching.....	1 00
Mrs. F. F. Rempel, Logan.....	" pillow shams	2 00
Miss Mattie German, Reynoldsburg.....	" " darned on tulle	3 00
Miss Laura Hardy, Marion.....	" velvet or satin muff	3 00
Miss Emma Miller, Xenia	" lady's robe	3 00
Mrs. Will Nourse, Columbus.....	" " dress	5 00
Mrs. A. E. Davis, Columbus.....	" child's dress	3 00
Miss Mamie Harter, Lewis Center.....	" suit of lady's underwear.....	5 00
Mrs. Mary Maxwell, Reynoldsburg.....	" lady's skirt	3 00
same	" " night dress	3 00

NEEDLEWORK—Continued.

Name and address.	Name of article.	Premium.
Miss Lou Allen, North Fairfield.....	Best bands and sleeves.....	\$1 00
Mrs. Willis Houser, Columbus.....	handkerchief.....	1 00
Mrs. F. F. Rempel, Logan.....	silk quilt.....	5 00
Mrs. A. E. Davis, Columbus.....	velvet quilt.....	5 00
Mrs. H. Bieber, Delaware.....	white quilt.....	3 00
Mrs. R. M. Johnston, Pataskala.....	patch-work quilt.....	2 00
Miss S. Chille, Columbus.....	fancy-worked quilt.....	2 00
Miss Ella A. Allen, North Fairfield.....	cradle quilt.....	1 00
Mrs. Chas. Parsons, Galion.....	bed spread, darned on tulle.....	3 00
Mrs. A. E. Davis, Columbus.....	display of millinery work.....	Sil. M.
same.....	specimen lady's hat.....	3 00
same.....	child's hat.....	2 00
same.....	bonnet.....	2 00
same.....	lady's bonnet.....	4 00
White Sewing Machine Co., Columbus.....	Best display of machine work.....	5 00
Mrs. T. Pool, Reynoldsburg.....	needlework.....	5 00

Awarding Committee.—Miss Carrie M. Thornfern, Mrs. Lizzie Rowe, Miss Lillie Brown.

SILK EMBROIDERY.

Name and address.	Name of article.	Premium.
Miss Tillie Reinhart, Columbus.....	Best table cover.....	\$5 00
Mrs. John Ashatt, Columbus.....	" scarf.....	5 00
Mrs. Elmer Hills, Delaware.....	" lounge cover.....	5 00
Mrs. Chas. Higgins, Columbus.....	" Ottoman cover.....	4 00
Mrs. Chas. Parsons, Galion.....	" chair cover.....	4 00
Mrs. G. W. Lewis.....	" picture.....	3 00
Miss Lena Stroteuk, Columbus.....	" sacque.....	4 00
Mrs. Elmer Hills, Delaware.....	" skirt.....	3 00
Mrs. Elizabeth Morgan, Ashland.....	" child's dress.....	4 00
Miss Lena Stroteuk, Columbus.....	" lady's dress.....	5 00
Mrs. A. E. Davis, Columbus.....	" wrapper.....	3 00
Miss Maggie Hills, Delaware.....	" slippers.....	2 00
Miss Stelzig, Columbus.....	" scarf.....	2 00
Mrs. H. C. Bostwick, Newark.....	" hat mark.....	1 00
Mrs. Chas. Higgins, Columbus.....	" lambrequin for mantle.....	4 00
Mrs. W. R. Sprague, Brice.....	" bracket.....	2 00
same.....	" fire screen.....	2 00
same.....	" sofa pillow.....	2 00
same.....	" foot rest.....	2 00
Miss Stelzig, Columbus.....	" slipper case.....	2 00
Miss Lena Stroteuk, Columbus.....	" shopping bag.....	2 00
Mrs. Chas. Higgins.....	" portfolio.....	2 00
Miss Lena Stroteuk, ".....	" display of silk embroidery.....	1 00

Awarding Committee.—Mrs. Jennie Kinnaird, Mrs. W. R. Postle, Mrs. Annie Bonar.

ART NEEDLEWORK.

Name and address.	Name of article.	Premium.
Miss Edith Greenleaf, Columbus.....	Best 3-panel fire screen.....	\$5 00
Mrs. Geo. W. Lewis, Columbus.....	" 1-panel ".....	5 00
Miss Mamie Harter, Lewis Centre.....	" piano cover.....	5 00
Miss M. E. Rath, Columbus.....	" scarf.....	4 00
Mrs. J. Cashatt, Columbus.....	" portiere.....	5 00
Miss Lucy Fairchild, Columbus.....	" table cover.....	5 00

ART NEEDLEWORK.—Continued.

Name and address.	Name of article.	Premium.
Mrs. W. S. Stimson, Columbus.....	Best table scarf.....	\$3 00
Mrs. Theo. Comstock, ".....	" ottoman or foot rest.....	2 00
Mrs. Geo. W. Lewis, ".....	" door panel.....	3 00
Mrs. S. E. Cook, ".....	" chair (upholstered).....	5 00
Mrs. Theo. Comstock, ".....	" chair strip.....	1 00
Mrs. Geo. W. Lewis, ".....	" sacque.....	3 00
Miss Bessie S. Claypool, ".....	" child's dress.....	3 00
Mrs. J. Cashatt, ".....	" pair wall panels.....	3 00
Mrs. W. S. Stimson, ".....	" shopping bag.....	1 00
Miss Lena Stroteuk, ".....	" portfolio.....	1 00
same ".....	" toilet set (cushions and bottles).....	1 00
same ".....	" sideboard cover.....	2 00
same ".....	" wall splasher.....	1 00
Miss Daisy Claypool, ".....	" dozen doilies.....	3 00
Mrs. W. R. Sprague, Brice.....	" set toilet mats (four pieces).....	3 00
Mrs. W. S. Stimson, Columbus.....	" towel.....	1 00
Mrs. J. Cashatt, ".....	" scrap basket.....	2 00
Mrs. W. S. Stimson, ".....	" mantle lambrequin.....	4 00
same ".....	" sofa pillow.....	3 00
Mrs. Elmer Hills, Delaware.....	" lady's wrapper.....	5 00
Mrs. Elizabeth Morgan, Ashland.....	" bed spread.....	5 00
Miss Amier, Columbus.....	" afghan.....	4 00
Miss Lena Stroteuk, Columbus.....	" book cover.....	2 00
Mrs. J. Cashatt, ".....	" apron.....	1 00
Miss Maggie Hills, Delaware.....	" slippers.....	1 00
Mrs. Wm. Turner, North Fairfield.....	" handkerchief case.....	1 00
Mrs. Charles Higgins, Columbus.....	" parasol.....	4 00
Miss Lena Stroteuk, ".....	" lamp screen.....	2 00
same ".....	" single specimen art needlework.....	5 00
same ".....	" display of art needlework.....	20 00

Awarding Committee.—Anna Jackson, Anna M. Pow, G. Cassell.

TURKISH OR APPLIED EMBROIDERY.

Name and address.	Name of article.	Premium.
Mrs. E. S. Boalt, Marion.....	Best table cover.....	\$5 00
Mrs. L. Trimble, ".....	" table scarf.....	3 00
A. E. Davis, Columbus.....	" sofa pillow.....	3 00
Miss M. E. Reth, ".....	" scrap basket.....	3 00
Mrs. J. Cashatt, ".....	" banner screen.....	4 00
Mrs. Wm. Holmes, Marion.....	" slippers.....	1 00

Awarding Committee.—Mrs. W. I. Chamberlain, Miss H. U. Maxon, Mrs. C. S. Chapman.

FRENCH OR SATIN STITCH EMBROIDERY COTTON AND LINEN.

Name and address.	Name of article.	Premium.
Mrs. W. R. Sprague.....	Best pillow shams.....	\$2 00
same.....	" six handkerchiefs.....	2 00
same.....	" yoke and cuffs.....	3 00
Miss Daisy Claypool.....	" chemise.....	2 00
Mrs. W. R. Sprague, Brice.....	" night dress.....	3 00
Miss Minnie Bieber, Delaware.....	" suit lady's underwear.....	5 00
Mrs. E. Hock, Marion.....	" hem stitching on two doilies.....	1 00
Mrs. W. R. Sprague, Brice.....	" skirt.....	3 00
Miss Mary Marshall, U. S. Barrecks, O.	" specimen drawn work.....	4 00
Mrs. W. R. Sprague.....	" display cotton and linen.....	5 00

FRENCH OR SATIN STITCH EMBROIDERY COTTON OR LINEN.—Continued.

Name and address.	Name of article.	Premium.
WORSTED AND SILK AND CROSS STITCH.		
Miss Alice Claypool, Columbus.....	Best chair strip	\$3 00
Mrs. R. F. Green, Columbus.....	" sofa pillow.....	2 00
Miss Mary Marshall, U. S. Barracks.....	" pin cushion.....	1 00
Miss Cornelia Knapp, Oberlin.....	" foot rest.....	2 00
Mrs. C. Pierce, Columbus.....	" picture.....	2 00
Miss Cornelia Knapp, Oberlin.....	" tidy.....	1 00
Miss L. A. Parsons, Gallion.....	" afghan.....	3 00
Mrs. L. Trimble, Marion.....	" slippers.....	1 00
Mrs. C. Pierce, Columbus.....	" display of five pieces.....	5 00

Awarding Committee.—Mrs. K. Hoskin, Mrs. E. F. Griswold, Miss H. U. Maxon.

OUTLINE EMBROIDERY.

Name and address.	Name of article.	Premium.
Miss Emma Klyzinski, Columbus.....	Best pair pillow shams.....	\$3 00
Miss Gertie Clark, Lithopolis.....	" wall splasher.....	2 00
Miss Daisy Claypool, Columbus.....	" tray cloth.....	2 00
Mrs. H. C. Boswick, Newark.....	" dozen doilies.....	2 00
Mrs. Elizabeth Morgan, Ashland.....	" table scarf.....	1 00
Miss Fannie Glenn, Columbus.....	" door panel.....	1 00
Mrs. W. R. Sprague, Brice.....	" table mats, not less than five.....	2 00
Mrs. Wm. Turner, North Fairfield.....	" mantle lambrequin.....	2 00
Mrs. Elizabeth Morgan, Ashland.....	" pair towels.....	1 00
Mrs. W. R. Sprague, Brice.....	" tidy.....	1 00
Mrs. H. C. Boswick, Newark.....	" specimen.....	3 00

Awarding Committee.—Mrs. Lizzie Rowe, Miss Carrie Thompson, Miss Lillie Brown.

BRAIDING AND LACE WORK.

Name and address.	Name of article.	Premium.
Miss Clara Bleber, Delaware.....	Best braided dress for child.....	\$3 00
Miss L. Trimble, Marion.....	" " pillow shams.....	2 00
Miss Clara Bleber, Delaware.....	" " carriage robe.....	3 00
Mrs. E. S. Boalt, Marion.....	" " skirt.....	3 00
Miss Minnie Bleber, Delaware.....	" " sacque.....	3 00
Miss Clara Bleber, Delaware.....	" " slippers.....	1 00
Miss Lou Allen, North Fairfield.....	" gold thread work.....	2 00
Mrs. Chas. Lee, Gahanna.....	" lace collar.....	2 00
Mrs. John Boyer, Circleville.....	" tatting collar.....	2 00
Miss Cornelia Knapp, Oberlin.....	" display of tatting.....	3 00
Mrs. Wm. Turner, North Fairfield.....	" lace handkerchief.....	3 00
Miss Emma Klyzinski, Columbus.....	" specimen point lace.....	4 00
L. C. Leeb, Columbus.....	" " macremmie lace.....	4 00
Mrs. E. Hock, Marion.....	" " gimquire lace.....	3 00
Mrs. M. P. Lacy, Wilmington.....	" " darning on tulle.....	3 00
Miss Emma Miller, Xenia.....	" " cretonne applique.....	2 00
Mrs. Willis Houser, Columbus.....	" " wool lace.....	2 00
Miss Sallie Woodward, Urbana.....	" display of lace work.....	5 00

Awarding Committee.—Mrs. T. R. Smith, Mrs. J. J. Hawkins, J. H. Hittler.

CROCHET WORK.

Name and address.	Name of article.	Premium.
Mrs. M. J. House, Marion.....	Best large afghan.....	\$5 00
Miss Emma Miller, Xenia.....	" child's afghan.....	3 00
Mrs. Wm. Turner, North Fairfield.....	" shawl.....	4 00
Mrs. R. J. Gardner, Jr., Chillicothe.....	" lady's hood.....	2 00
Mrs. Vencie Wright, Columbus.....	" child's hood.....	2 00
Miss Minnie Bieber, Delaware.....	" nubia.....	3 00
Miss E. Barringer, Columbus.....	" fascinator.....	3 00
Mrs. Elizabeth Morgan, Ashland.....	" sacque.....	3 00
Miss Cornelia Knapp, Oberlin.....	" mittens.....	1 00
Mrs. E. J. Paddock, Delaware.....	" wristlets.....	1 00
Miss Lou Allen, North Fairfield.....	" leggings.....	2 00
Mrs. Amelia Knapp, Fitchville.....	" infant's socks.....	1 00
Mrs. L. Trimble, Marion.....	" collar.....	1 00
Miss Cornelia Knapp, Oberlin.....	" chair tidy.....	2 00
Mrs. Wm. Turner, North Fairfield.....	" toilet set.....	2 00
Mrs. E. J. Paddock, Delaware.....	" set table mats.....	2 00
Mrs. L. Trimble, Marion.....	" slippers.....	2 00
Mrs. M. J. House, Marion.....	" overshoes.....	2 00
Ella A. Allen, North Fairfield.....	" muff.....	3 00
Elizabeth Morgan, Ashland.....	" display of crochet work.....	10 00

Awarding Committee.—Mrs. Hallie Wiggins, Mrs. Mattie E. Cassady, Miss Helen Ticknor.

HOUSEHOLD ORNAMENTAL WORK.

Name and address.	Name of article.	Premium.
Mrs. Wm. Turner, North Fairfield.....	Best specimen hair work.....	\$3 00
same.....	" specimen bead work.....	3 00
Mrs. Ellen King, Brice.....	" artificial flowers.....	3 00
Miss Addie Shader, Columbus.....	" specimen wax flowers.....	3 00
Mrs. Mary Adolph, Columbus.....	" preserved flowers.....	4 00
Miss Lou Allen, North Fairfield.....	" preserved ferns.....	3 00
Mrs. S. D. Hallock, Columbus.....	" display wax flowers.....	5 00

Awarding Committee.—E. G. Hulbert, Mrs. Chas. Higgins, Miss M. E. Smalley.

CABINET WARE.

Name and address.	Name of article.	Premium.
Columbus Cabinet Co., Columbus.....	Best chiffonier.....	\$5 00
Halm & Bellows Furniture Co., Columbus.....	" display of fancy cabinets.....	8 00
Ohio Furniture Co., Columbus.....	" office chair.....	3 00
Columbus Cabinet Co., Columbus.....	" center table.....	5 00
Halm & Bellows Furniture Co., Columbus.....	" folding bedstead.....	4 00
Mrs. M. J. Liggett, Wooster.....	" child's bedstead.....	3 00
Ohio Furniture Co., Columbus.....	" set of parlor furniture.....	20 00
Columbus Cabinet Co., Columbus.....	" " chamber furniture.....	20 00
Halm & Bellows Furniture Co., Columbus.....	" " library furniture.....	15 00
same.....	" " dining-room furniture.....	10 00
Ohio Furniture Co., Columbus.....	" display of furniture.....	\$11. M.
Halm & Bellows Furniture Co., Columbus.....	" " mattresses.....	8 00
Chas. H. Cruse, Columbus.....	" spring mattress, hair top.....	5 00
Columbus Cabinet Co., Columbus.....	" spiral spring-bed bottom.....	3 00
Hughes & Grierson, Columbus.....	" woven wire mattress.....	3 00

CABINET WARE.—Continued.

Name and address.	Name of article.	Premium.
Halm & Bellows Furniture Co., Columbus	Best writing desk for office use	\$3 00
Ohio Furniture Co., Columbus.....	" " " ladies	3 00
same	" book case and secretary.....	5 00
same	" wardrobe	5 00
same	" invalid chair or couch.....	5 00
Columbus Cabinet Co., Columbus.....	" display of chairs	10 00
same	" hall rack	5 00
Halm & Bellows Furniture Co., Columbus	" mantel glass.....	5 00

Awarding Committee—S. S. Mathers, J. F. Doty, W. F. Morey.

MERCHANTS' AND DEALERS' CLASS.

Name and address.	Name of article.	Premium.
Wm. Burdell, Jr., Columbus.....	Best display carriage robes	\$5 00
Mrs. A. E. Davis, Columbus	" " hats	5 00
Wm. Burdell, Jr., Columbus	" fur robe	3 00
same	" display of horse blankets.....	3 00
J. Gundersheimer & Sons, Columbus.....	" child's dress	3 00
Bowe & Beggs, Columbus	" display of carpets.....	5 00
same	" curtains and lambrequins.....	5 00
same	" " window shades	Dip.
same	" " hearth rugs.....	5 00
J. Gundersheimer & Sons, Columbus.....	" business suit of gent's clothing	5 00
same	" dress " "	5 00
same	" gent's overcoat.....	5 00
same	" display of gent's furnishing goods.....	4 00
same	" " ready-made clothing.....	10 00

Awarding Committee—J. F. Doty, S. S. Mathers, W. F. Morey.

BOOTS, SHOES, Etc.

Name and address.	Name of article.	Premium.
C. D. Pitts & Son, Columbus.....	Best traveling trunk	\$3 00
W. H. McDermith & Co., Columbus	" pair dress boots	3 00
same	" " heavy boots	3 00
same	" " men's hand-sewed calf boots.....	3 00
C. D. Pitts & Son, Columbus.....	" " men's heavy boots	2 00
W. H. McDermith & Co., Columbus	" " men's hand-sewed calf butt'n shoes	3 00
same	" " lady's hand-sewed kid butt'n shoes	2 00
Famous Shoe House, Columbus	" " lady's and men's low shoes.....	2 00
same	" " lady's slippers	2 00
same	" " gent's slippers	2 00
W. H. McDermith & Co., Columbus	" " infant's shoes	1 00
same	" display of boots and shoes	5 00

Expert Committee—Nelson A. Sims.

ELEVENTH DEPARTMENT—FINE ARTS.

DRAWINGS, PAINTINGS, ETC.

Name and address.	Name of article.	Premium.
John N. Piersche, Columbus	Best life size portrait in oil, from sittings only...	\$10 00
same	" life size portrait in oil, from photograph or other picture	10 00
A. W. Tidd, Lancaster	" portrait in oil of horses, bull, or cow, the entire animal, not the head only	10 00
Thos. Matthew, Columbus	" specimen of oil painting (original)	10 00
John N. Piersche, Columbus	" landscape from nature, in oil, by Ohio artist	10 00
same	" specimen fruit or flower paintings in oil	5 00
same	" exhibition of paintings in oil	20 00
same	" landscape from nature, water colors	10 00
same	" exhibition of paintings, water colors	5 00
G. C. Urlin, Columbus	" crayon drawing	15 00
AMATEUR LIST.		
John E. Hussey, Columbus	Best specimen of oil painting from copy	5 00
Mrs. D. S. Neville, Columbus	" landscape from nature in oil	5 00
John E. Hussey, Columbus	" portrait in oil from copy	5 00
Miss Susie C. Anderson, Columbus	" fruit or flower paintings in oil	5 00
John E. Hussey, Columbus	" exhibition of paintings in oil	10 00
WATER COLORS.		
Miss Ella Fraser, Columbus	Best specimen painting in water colors	5 00
John E. Hussey, Columbus	" landscape from nature, water colors	5 00
H. I. Gold, Columbus	" landscape from copy, water colors	5 00
Miss Susie C. Anderson, Columbus	" fruit or flower painting, water colors	5 00
same	" exhibition of paintings, water colors	10 00
same	" crayon drawing	5 00
SILVER SATIN PAINTING.		
Miss Ella Smith, Columbus	Best specimen painting on silk or satin	5 00
S. A. Heintz, Columbus	" specimen of painting on velvet	5 00
Mrs. B. G. Wright, Columbus	" fan painted on silk or satin	2 00
Mrs. Chas. Lee, Gahanna	" screen or banner painted on silk or satin	3 00
Mrs. E. S. Boalt, Marion	" display painting on silk or satin, 10 pieces	10 00
CHINA PAINTING.		
Miss Carrie Hayes, Columbus	Best display of painting on china	10 00
same	" specimen of painting on china	5 00
Miss Anna Fairchild, Columbus	" plaque	5 00
Miss Carrie Hayes, Columbus	" six plates	5 00
same	" six cups and saucers	5 00
Mrs. C. E. Stewart, Portsmouth	" vase or jar	5 00
Jane M. Cook, Columbus	" decorated pottery	5 00
Miss Olive Slade, Columbus	" shaded charcoal drawing, from copy or object	3 00
Miss Susie C. Anderson, Columbus	" stump drawing, from copy or object	3 00
Mrs. D. S. Neville, Columbus	" crayon point drawing, from copy or object	3 00
John E. Hussey, Columbus	" brush drawing, from copy or object	3 00
Miss Olive Slade, Columbus	" sketch of a landscape from nature in pencil or brush	3 00
MECHANICAL DRAWING.		
Harry Spencer, Columbus	Best orthographic projection	5 00
Mrs. D. S. Neville, Columbus	" mechanical perspective	3 00
H. Tippet, Columbus	" machine drawing	5 00
Harry Spencer, Columbus	" architectural drawing	5 00
PHOTOGRAPHS AND MISCELLANEOUS.		
G. C. Urlin, Columbus	Best spec. photograph colored in water colors	8 00 or Sil. M.
same	" specimen photograph, colored in India ink	8 00 or Sil. M.
same	" two dozen carte visites of children	5 00
same	" two dozen carte visites of adults	5 00
same	" one dozen cabinet photographs	5 00 or Sil. M.
same	" large plain photograph	Sil. M.
same	" display of photographs	10 00
Columbus Business College, Columbus	" specimen penmanship	Dip.
same	" specimen ornamental penmanship	Dip.

SCULPTURE, ETC.

Name and address.	Name of article.	Premium.
Miss Florence Todd, Columbus.....	Best general display of carving in wood.....	\$15 00
Mrs. E. E. Stewart, Portsmouth.....	Best head, bust or figure from copy.....	5 00
same.....	Best original ornamental design.....	5 00

MUSICAL INSTRUMENTS.

Name and address.	Name of article.	Premium.
C. D. Williamson, Columbus.....	Best upright piano.....	\$10 and Sil. M.
same.....	Best square piano.....	10 and Sil. M.
Joseph Harris, Columbus.....	Best reed organ.....	Silver Medal.
same.....	Best violin.....	3 00
P. G. Hall, Columbus.....	Best guitar.....	3 00
same.....	Best flute.....	3 00
Joseph Harris, Columbus.....	Best clarionet.....	3 00
same.....	Best collection musical instruments.....	Silver Medal.

DEPARTMENT OF EDUCATION.

Name and address.	Name of article.	Premium.
Public Schools, Gallipolis.....	Best general work from a system of schools.....	Sil. M.
same.....	Best general work from high schools.....	Dip.
same.....	Best general work from any one grade or class of a high school.....	Dip.
same.....	Best general work from any one grade or class of grammar school.....	Dip.
same.....	Best map drawing of the United States, or of Ohio, by a set of grammar schools.....	Dip.
same.....	Best general work from a system of primary schools.....	Dip.
same.....	Best general work from any one grade of primary schools.....	Dip.
same.....	Best written work from first year in primary school.....	Dip.
same.....	Best general work from any one grade of high school.....	Dip.
same.....	Best general display of drawing from a system of public schools.....	Sil. M.
Columbus Public School, B Grammar, Fulton street, Emma Howald.....	Best display of original designs from a school or system of schools.....	Dip.
Public Schools, Gallipolis.....	Best work in music from a high school.....	Dip.
same.....	".....	Dip.
same.....	Best work in music from a system of schools.....	Dip.
Grace Grove, Spring Street School, Columbus.....	Best drawing book from any one pupil in primary school.....	\$3 00
Florence Montgomery, Douglass School, Columbus.....	Best drawing book from any one pupil in grammar school.....	3 00
August Rombacher, Mound Street School, Columbus.....	Best original design by a pupil in a primary school.....	2 00
Wm. Tresset, Fulton Street School, Columbus.....	Best original design by a pupil in a grammar school.....	2 00

DEPARTMENT OF EDUCATION—Continued.

Name and address.	Name of article.	Premium.
Mary Bromley, High School, Columbus...	Best original design by a pupil in a high school	\$2 00
Virginia Nesmyth, Columbus.....	Best design in color for decorative purposes	2 00
Jennie Patterson, "	Best outline drawing from the solid model...	2 00
Alma Schaub, "	" " " plaster cast...	2 00
Jennie Patterson, "	Best drawing shaded with stump	2 00
Gertrude Gregg, "	" " the brush	2 00
Public School, Oberlin.....	Best general work from a system of grammar schools.....	Dip.
Stella Hamilton, B Grammar, Rich Street Columbus	Best drawing of geometrical problems with instruments	2 00
Fred. Stroedter, B Grammar, Third Street German, Columbus.....	Best projection drawing with instruments...	2 00
Lilla Piper, Columbus	Best mechanical perspective drawing with instruments	2 00
Earl Gilliam, Columbus.....	Best architectural drawing.....	3 00
Grace Grove, Columbus	Best machine drawing	3 00
UNGRADED SCHOOLS.		
Sub-District, No. 5, Maskingum Township, Washington County, Elizabeth Basim, Teacher.....	Best general work from an ungraded school	Dip.
Sub-District, No. 5, Maskingum Township, Washington County, Elizabeth Basim, Teacher.....	Best map drawing of the United States, or of Ohio	Dip.

Awarding Committee—E. O. Randall, Mary E. Cunningham, D. J. Guerin.

COMMENDED ARTICLES.

SIXTH DEPARTMENT.

Name.	Postoffice.	Name of article.
John Noggle.....	Plymouth.....	Six stocks carrots.
same	"	Black Spanish radishes.
same	"	Red cabbage.
same	"	Three vegetable oysters.
same	"	Kohl-rabi.
Mary J. Smith.....	Lindenville.....	Pickled pears.
John Noggle.....	Plymouth.....	Belle potatoes.
same	"	Pride of the Valley potatoes.
same	"	Early State of Maine.
same	"	Landrith Garfield.
same	"	Late Ohio.
same	"	Winter radishes.
same	"	Nekale.
S. R. Holt	Worthington	Red China squash.

Awarding Committee.—A. B. Thompson, E. W. Brown, V. A. P. Ware.

NINTH DEPARTMENT.

Name.	Postoffice.	Name of article.
McMurray & Fisher.....	Marion	Skeleton wagon.
Ajustable Sawtooth Co.....	Columbus	Stinebring ajustible toothed circular saw.
Jas. J. Fetzer	Columbiana	Set of springs and gear.
Columbus Roller Skate Co.....	Columbus	Display of roller skates.
Moehl & Pausch	"	Patrol wagon.
Troy Buggy Works.....	Froy	Jump seat surry wagon.
same	"	
same	"	End spring surry wagon.
W. M. Lake.....	Columbus	Milk-stool and bucket combined.
Alexander McClintock	Burgettstown, Pa....	Woman's friend churn power.
Wm. Kessler.....	East Ringold, O.....	Fire cooler.
Jos. Rath.....	Columbus.....	Broom-hanger, washer cutter, and can opener.
Blackwood, Green & Co.....	"	Galvanized iron ventilators.
H. S. & C. B. Comstock	"	Box lid fastening.
National Sheet Metal Roofing Co.....	New York City, N. Y.	Metal shingles.
Haydenville Mining and Man'g Co.	Haydenville	Fire proofing.
same	"	Street paving block.
N. P. Mix	Avenue	Broom holder.
J. M. Hatcher.....	Springfield	Economy halter and hame strap buckle.
F. L. Johnson.....	Worthington	Can for destroying insects.
Columbus Carriage and Wagon Co...	Columbus	Gear, body, dash, and see rail with shifting rail.
same	"	Piano body with seat.
Jas. J. Felzer.....	Columbiana	Herbrand drop perch gear iron.
Frank & Heinze	Columbus	Display umbrellas, parasols, etc.
A. A. Fradenburg	Port Washington	Peach parer.
same	"	Peach stoner.
S. Jarvis.....	Westerville	Garden worker.
Moehl & Pausch.....	Columbus	Heavy truck.
M. & E. K. Hayes.....	"	Physician's phaeton.
same	"	Two seated surry wagon.
same	"	Canopy-top phaeton.
G. Schreyer.....	"	Heating stove.
Van Behren & Shoffer	Stryker	Boat oar.
John Immel & Son.....	Columbus	Jagger wagon.
same	"	Surry wagon.
C. H. Stratton.....	Salem	Carriage body.
same	"	"
same	"	Display of seats.

NINTH DEPARTMENT—Continued.

Name.	Postoffice.	Name of article.
W. Hunt	Boston, Mass.....	Never-slip horse shoe.
Jas. J. Felzer.....	Columbiana	Dis. of carriage springs and gearing.
Chicago Metal Felloe Co.....	Chicago, Ill.....	Tubular wrought iron felloes.
Andrews & Burnap.....	Dubuque, Iowa.....	Churn.
Alice Primix	Circleville.....	Pair curtains darned on tulle.
Miss Alice Claypoole	Columbus.....	Apron, cross-stitch.
Miss Daisey Claypoole.....	"	One-half dozen com. napkins.
same	"	Curtain for bookcase.
Miss Bessie S. Claypoole.....	"	One dozen lunch napkins.
same	"	Door curtain.
Halm & Bellows Furniture Co.....	"	Display wood mantles and settings.
Keffer & McDowell.....	"	Display electric supplies.
Wm. Langham	Belleville.....	Collection of shells and coral.
Paul Gurney.....	Alexandria.....	Fancy horn chair.
Wilcox Manufacturing Co.....	Garrettsville.....	Success Evaporator.
Mrs. Venice Wright	Columbus.....	Chemise yoke.
Mrs. O. G. Power	Newark	Display of silk.
J. B. King.....	Cincinnati.....	Hat and coat holder.
Miss Mattie German.....	Reynoldsburg	Apron darned on tulle.
M. P. Co.....	Jackson, Mich.....	Corn scalper and center finger steel.
Mary J. Hinderschied	Columbus.....	Alb lace.
Mrs. A. T. Kraner.....	Reynoldsburg.....	Silk lace.
same	"	Cross-stitch tidy.
Hattie E. Turner.....	"	Pillow sham holder.
Mrs. S. M. Ferguson.....	Baltimore, Md.....	Silk quilt.

Awarding Committee.—L. A. Dackenaer, Ed. Orton, Jr., O. K. Ellis, Mat. Brooks.

ELEVENTH DEPARTMENT.

Name.	Postoffice.	Name of article.
Jos. Harrie	Columbus.....	Upright piano.
same	"	Square piano.

LIST OF EXHIBITERS.

The following is an alphabetical list of *all exhibitors at the State Fair of 1885*, together with the class of exhibits shown by each.

The names are arranged *alphabetically* for the first letter, and the first vowel (*a, e, i, o, u, y*) in each name.

The list is prepared for the convenience of shippers, railways, transfer, expressmen, telegraph and mail delivery, etc., etc.

<i>Name and post-office.</i>	<i>Articles exhibited.</i>	<i>Name and post-office.</i>	<i>Articles exhibited.</i>
Ady, Mrs. J. H., Columbus.....	Butter, bread, etc	Boehm, Peter, Columbus.....	Cattle
Adjustable Sawtooth Co., Columbus.....	Saws	Boalt, Mrs. E. S., Marion.....	Needlework
Adolph, Mrs. Mary, Columbus,		Boswick, Mrs. K. C., Newark.....	Needlework
	Ornamental work	Bowman, Amos, Somerset.....	Shorthorn cattle
A. F. & M. Works, Anderson, Ind.,		Bowdery, B. F., New Dover.....	Draft horses
	Tile machine	Bower, J. S., Plain City.....	Draft horses
Alexander, Jas. H., agent, Columbus		Bradford, H., Rochester Depot,	
	Thoroughbred horses		Poland China swine
Aldows, Miss Emma, Columbus.....	Flowers	Brown, S. Murray, Columbus,	
Allen, Miss Lou N., Fairfield.....	Needlework		Light harness horses
American Whip Co., Westfield, Mass.....	Whips	Brown, D. W., Tiffin.....	Shorthorn cattle
Anderson, J. K. & Son, Anderson,		Brown, James, Livingston.....	Farm products
	Sheep and cattle	Brown, A. M., Groveport.....	Farm products
Anderson, Mrs. J. K., Columbus.....	Fruit	Brigham & Clayburg, New London.....	Bees
Andrews & Burnap, Dubuque, Iowa.....	Churn	Brant, F., Chillicothe.....	Fruit
Anderson, Miss Susie, Columbus.....	Painting	Brown Manufacturing Co., Zanesville.....	Vehicles
Appleman, A. R., Columbus,		Brundige, Thos., Kingstown.....	Mules
	Matched and saddle horses	Brice Furnace Co., Dayton.....	Furnaces
Armstead, R. R., Dublin.....	Roadster horses	Bratton, R. H., Columbus.....	Paintings
Armstrong & Staley, Alliance.....	G. P. horses	Brooks, Mrs. W. W.....	Paintings
Arty Bros., Osborn.....	Long-wool sheep	Bushnell, Thos., Columbus.....	Grain, etc
Ashbrook, M. P., Granville.....	Merino sheep	Buchwalter, H. J., Hallsville.....	Grain, etc
Atkinson, Mrs. G. W., Columbus,		Buck, H., Delaware.....	Farm products
	Needlework	Baumgartner, Fred., Chillicothe.....	Fruit
Ackerman, John, Columbus, Saw-mill dog.		Burton, Van, Lancaster.....	Fruit
Anderson Foundry and Machine Works, Brick		Burdell, Wm., Jr., Columbus.....	Harness
Machine, Anderson, Ind.		Buckeye Buggy Co., Columbus.....	Vehicles
Aultman & Co., C. Messrs., Mowers, Respers,		Buck, F. & Son, Columbus.....	Brooms
etc., Canton. W. E. Septon, General Agent,		Burnham, M. L., Mechanicsburg.....	Horses
Mt. Vernon, O.		Butler, F. S., Ridgeway.....	Sheep
Avery Planter Co., Peoria, Ill. J. A. Corry,		Brewer, H. & Co., Tecumseh, Mich.....	Machinery
General Agent, Columbus, O.			
Barranger, Mrs. E., Columbus.....	Needlework	Baker & Bro., S. H., Fertilizers, N. Y. City.	
Barnhart, Miss Ollie, Marion.....	Needlework	Battle Creek Machinery Co., Drag Saw Ma-	
Baker, Mrs. J. W., Columbus.....	Flowers	chines, Battle Creek, Michigan.	
Baker, C. W., Mansfield.....	Swine	Beatty & Harrison, Feed Cutters, Canton, O.	
Barr, W. F., Brice.....	Farm products	Beedle & Kelly Co., The Planter and Check-	
Barr, Mrs. G. S., Brice.....	Needlework	er, Troy, Ohio.	
Bailey, Miss Jennie M., Columbus.....	Painting	Bentz, W. M., General Agent Superior Drill	
Baum, W. C., Duval.....	Draft horses	Co., Ashland, Ohio.	
Beal, John, Pt. Williams.....	Horses	Bennett, H. C., Stump-puller, Westerville, O.	
Beard, D. M. & Sons, Anderson.....	Sheep	Birdsall Manufacturing Co., Clover-huller,	
Bennington, Thomas, La Porte.....	Cattle	South Bend, Ind.	
Bellnap, S., Columbus.....	Horses	Blackburn, A. C., Railway Signal, Springfield,	
Belk, J. A., Ashley.....	Horses	Ohio.	
Bell Bros., Wooster.....	Horses	Boomer & Bosehart, Manufacturers Cider	
Betts, H., Wellington.....	Cattle	Mills, Detroit, Michigan.	
Beerbower, Mrs. P., Marion.....	Preserves, etc	Brown Manufacturing Co., Wagons and Culti-	
Bessie, Dr., Delaware.....	Bees	tors, Zanesville, Ohio.	
Benedict, A., Bennington.....	Bees	Bradley Manufacturing Co., Plows and Culti-	
Burns & Greiner, Columbus.....	Vehicles	vators, Chicago, Ill.	
Blackwell, Lester W., Jefferson.....	Horses	Brown-Milly Plow Co., Plows, Malta, Ohio.	
Bieber, H., Delaware.....	Farm products	Bucher, Gibbs & Co., Plows, Canton, Ohio. J.	
Bieber, Mrs. H., Delaware.....	Butter, bread, etc	E. Myers & Co., General Agents, Ashland, O.	
Bieber, Miss Mamie, Delaware.....	Needlework		
Black, J. M., Newark.....	Cattle	Campbell, Geo. W., Delaware.....	Fruit
Blatchford, E. W. & Co., Chicago, Ill.,		Cashatt, Mrs. John, Columbus.....	Needlework
	Stock food	Chambers, J. M., A venue.....	Draft horses
Blackford, C. E., Morenzi, Mich.....	Cattle	Charles, Fred., Columbus.....	Farm products
Blackburn, A. B., Springfield.....	Machinery	Clappool, Miss C. L., Columbus,	
Blackwood, Green & Co., Columbus.....	Roofing		Butter, bread, etc
Bowe & Beggs, Columbus.....	Carpets, etc	Clifford & White, Wellington, Berkshire swine	
Boyer, Mrs. John, Circleville.....	Preserves, etc	Claypool, Miss Daisy, Columbus.....	Needlework
Bookwalter, H., Hallsville.....	Fruit	Clark, Miss Gertie, Lithopolis.....	Needlework
		Cloyd, G. S., Ithaca.....	Hereford cattle
		Clickinger, Earl, Columbus.....	Bees

LIST OF EXHIBITERS—Continued.

<i>Name and post-office.</i>	<i>Articles exhibited.</i>	<i>Name and post-office.</i>	<i>Articles exhibited.</i>
Chicago Metal Felloe Co., Chicago.....	Vehicles	Elliott, Geo., Columbus.....	Light harness horse
Cox, Nelson, Bradrick.....	Fruit	Elliott, B. F., Alton.....	G. P. horses
Corder, Miss Jennie, Columbus.....	Flowers	Enrich, T., Columbus.....	Stoves
Columbus Warm Air Furnace Co.....		Estep, Wm., Loydsville.....	Thoroughbred horses
Columbus Furnaces.....		Ewalt, H. W., Centerburg.....	Mules
Columbus Roller Skate Co., Columbus.....	Skates	Evans, Maurice, Columbus.....	Flowers
Comstock, A. S. & C. B., Columbus.....	Fasteners	Evans, Mrs. Hugh, Columbus.....	Needlework
Col. Carriage and Wagon Co., Columbus.....		Ewing, Miss Mamie.....	Painting
Cook & Morse, Raymond.....	Buggy bodies	Eagle Machine Co., manufacturers.....	Corn Shellers, Lancaster.
Cook, Stephen, Lewis Centre.....	Merino sheep	Edinburg Agricultural Works, Threshers, Edinburg, Va.....	
Coffman, Miss H., Columbus.....	Flowers	Economist Plow Co., South Bend, Indiana.....	Plows
Cotter, Mrs. Doc., Columbus.....	Needlework	Elliott & Reed, Fencing Machines, Richmond, Indiana.....	
Coon, E. Marion.....	Fat cattle	Eureka Mower Co., Mowers, Utica, N. Y.....	Columbus Hay Tool Co., agents, Columbus.
Col. Cabinet Co., Columbus.....	Cabinet ware	Evans, A. C., Manufacturing Co., Corn Planters, Springfield.....	
Collins, Mrs. C., Cleveland.....	Needlework		
Copper & McFarland, Mt. Vernon.....			
Cook, Sadie E., Columbus.....	Merino sheep	Fairweather & Mason, McLean, Pa.....	Cattle
Comstock, Mrs. Theo., Columbus.....	Needlework	F. Ir, W. C., Cleveland.....	Horses
Courtright, Edward, Galloway.....	G. P. horses	Farmsworth, Mrs. W. W., Watersville.....	Preserves, etc
Cott, Miss Clara, Columbus.....	Needlework	Famous Shoe House, Columbus.....	Boots & shoes
Craig, Alvin, Cadiz.....	Merino sheep	Fairechild, Miss Anna, Columbus.....	Painting
Crawford, G. W., Newark.....	Sad. and light horse	Felzer, James J., Columbiana.....	Vehicles
Collins, Miss Essie, Columbus.....	Painting	Field, Albert, Mifflinsville.....	Horses
Col. Business College, Columbus.....	Penmanship	Firestone, Jason, Columbus.....	Horses
Coshocton Public Schools.....	General Work	Fleming, C. D., Columbus.....	Signs
Columbus Public Schools.....	General Work	Fobes, E. A., Lindenville.....	Cheese
Cummings, W. D., Hope.....	Fence	Foster, Lee S., Charleston.....	Horses
Case, J. I., Threshing Machine Co., Manufacturers Engines and Threshers, Racine, Wis.....		Fox, John H., Kessler.....	
John Ackerman, Agent, Columbus.....		Freeman, W. W., Col.....	Light harness horses
Chandler & Taylor, Tile Machines, Indianapolis, Ind.....		Frank, John, Columbus.....	Scroll work
Chambers, Boring, Quinlan Co., Wire check-rower, Decatur, Ill.....		Frenche Bros., Cincinnati.....	Cattle
Chieftain Hay Rake Co., Hay Rakes, Canton, O.....		Freeman, Isaac, Rex.....	Farm products
O. J. D. Jones, General Agent, Columbiana, Ohio.....		Freeman, Frank, Tadmire.....	Fruit
Cincinnati Desicating Co., Fertilizers, Cincinnati, Ohio.....		Freese & Fate, Plymouth.....	Machinery
Coates & Co., A. W., Hay Rakes, Alliance, O.....		Fradenburg, A. A., Pt. Washing'n.....	Apple parer
W. S. Howard, General Agent, Alliance.....		Fraser, Miss Ella, Columbus.....	Painting
Columbus Hay Tool Co., Hay Tools, Columbus.....			
Columbia Drill Co., Grain Drills, Jamestown, New York.....		Farmers' Friend Manufacturing Co., Grain Drills, Dayton.....	P. O. Sharpless, General Agent, Marion.
Conklin, Tait & Co., Wire check-rower, Decatur, Ill.....		Field & Co., J. A., Agricultural Implements, St. Louis, Mo.....	
Crosby & Son, L. M., Grader Wheat-fan, Ash-tabula, Ohio.....		Foos Manufac'g Co., Grinding Mills, Springfield.....	
Dann, Miss Mamie E., Columbus.....	Needlework	Gardner, Mrs. R. J., Jr., Chillicothe.....	Needlew'k
Davidson, A., Lancaster.....	Roadster horses	Gaver, Mrs. M. J., Fremont.....	Needlework
Dague, Geo., Hope.....	Farm products	Garringer, Benton, Washington C. H.....	Cattle
Davis, Mrs. A. E., Columbus.....	Needlework	Gay, Dwight, Columbus.....	Horses
Day, Mrs. Edith, Jacksontown.....	Needlework	Gear, Freeman, Platt & Co., Cleveland.....	Vehicles
Davis, C. E., Columbus.....	Piano chair	Gegg, Miss Minnie, Marion.....	Needlework
Delano, L. G., Kinnikinick.....	Horses	German, Miss Mattie, Reynoldsburg.....	
Doney, C. G., Columbus.....	Farm products		
Doty, Sackett & Co., Delaware.....	Vehicles	German, G. H., Franklin, Mich.....	Cattle & sheep
Dresbach, Nelson, Hallsville.....	Fruit	Geisey, Mrs. H. R., Columbus.....	Needlework
Dresbach, Miss Jennie, Hallsville.....	Painting	Gibbs, J. B., Cleveland.....	Holstein cattle
Duer, Daniel, Millersburgh.....	Apples	Glenn, Miss Fannie, Columbus.....	Needlework
Dun, Davis D., Dublin.....	Churn	Gallipolis Public Schools.....	General work
		Goodrich, A. S., Worthington.....	Bees
Dayton Plow Co., Plows, Dayton.....		Goldsmith, Henry, Columbus.....	Brackets
Deere & Co., Plows, Moline, Ill.....		Gotchall, Mrs., Columbus.....	Needlework
Deere & Mansur, Corn Planters, Moline, Ill.....		Goldsmith, Miss H., Columbus.....	Needlework
Deering & Co., Wm., Self-binders, Chicago, Ill.....		Gould, Miss Lizzie, Athens.....	Needlework
S. S. Hotchkiss, General Agent, Mansfield.....		Goldsmith, A. J., Shiloh.....	Clydesdale horses
Denlinger & Good, Iron Gates, Harrisburg, Jampton P. O., Ohio.....		Goldsmith, David, Columbus.....	Mattresses
Deuscher, H. P., Farm Implements, Hamilton, Ohio.....		Greer, H. M. & C. S., Columbus.....	Fowls
Diamond, G. A., General Agent Plane Manuf. Co., Milan, Ohio.....		Gregg, Miss Minnie, Marion.....	Needlework
		Greenleaf, Miss Edith, Columbus.....	Needlework
		Green, Mrs. B. F., Columbus.....	Needlework
		Gundersheimer, J. & Son, Columbus.....	Clothing
		Gurney, Paul, Alexandria.....	Horn chair
Eaton, J. H. & H. P., Bucyrus.....	Swine and cattle	Gulick, Lizzie, Columbus.....	Paintings
Edwards, J. O., Youngstown.....	Shorthorn cattle	Guthrie & Moore, Marion.....	Draft horses

LIST OF EXHIBITERS—Continued.

<i>Name and postoffice.</i>	<i>Article exhibited.</i>	<i>Name and postoffice.</i>	<i>Article exhibited.</i>
Gaar, Scott & Co., threshing machines, Richmond, Ind.		Jarvis, S., Westerville.....	Garden worker
Gholson Fencing Co., fences, Cincinnati, A. N. Perrill, agent, Columbus.		Jamison, Mrs. E. H., Delaware.....	Needlework
Gibbs & Bail, Plow Co., plows, Canton.		Johnson, F. H., South Bend, Ind.....	Cattle
Globe Machine Co., feed cutters, Lima.		Jones, C. E., Delaware.....	Bees
		Johnson, Jas., Chillicothe.....	Fruit
		Jones, A. O., Columbus.....	Drain tile
		Johnson, Mrs. E. E., Pataskala.....	Needlework
Hatfield, Mrs. Sallie, Lebanon.....	Preserves, etc.	Jones, J. D., General Agent, Chieftain Hay Rake Co., Columbus.	
Harrison, W. S., Malaga, N. J.....	Fruit		
Halley, W. S., Columbus.....	Plumbers' goods	Karnes, L., Camp Chase.....	Horses
Hayes, M. & E. K., Columbus.....	Vehicles	Kaiser, Miss M., Chillicothe.....	Fruit
Haydenville Mining and Manufacturing Co., Haydenville.....	Terra cotta	Keckley, J. & V., Marysville.....	Grain
Hannum, J. C., Groveport.....	Horses	Kemp & Burfel, Syracuse, N. J.....	Vehicles
Harris & Williams, Upper Sandusky.....	Horses	Keiser & Hanna, Columbus.....	Kitchen safes
Hatcher, I. M., Springfield.....	Halters, etc.	Kephart, Geo. H., Spencerville.....	Clothes horse
Hardy, Miss Laura, Marion.....	Needlework	Kessler, Wm., East Ringold.....	Fire cooler
Hallock, Mrs. S. D., Columbus.....	Wax work	Ketter & McDowell, Columbus.....	Electric sup's
Halm & Bellows Furniture Co., Columbus.....	Cabinet ware	King, D. D., Wilmington.....	horses
Harter, Miss Mamie, Lewis Cen.....	Needlework	Kainerd, Mrs. J. D., Camp Chase.....	Butter, bread, etc.
Hass, Mrs. Carrie, Columbus.....	Needlework	Klug, Mrs. Ellen, Brice.....	Needlework
Haley, Mrs. John P., Cleveland.....	Needlework	King, J. B., Cincinnati.....	Hat holder
Henry, Mrs. Jos., Columbus.....	Needlework	Klyzinski, Miss Emma, Columbus.....	Needlework
Hallock, Mrs. S. D., Columbus.....	Drawing	Knapf, Miss Cornelia, Oberlin.....	Needlework
Harris, Mrs. Jos., Columbus.....	Painting	Knapf, Miss Amelia, Fitchville.....	Needlework
Hayes, Miss Carrie, Columbus.....	Painting	Koerner, John, Alton.....	Horses
Harris, Jos., Columbus.....	Musical instruments	Koepplin, Mrs. C., Marysville.....	Needlework
Heckman, H., Elmora.....	Vehicles	Kroninger, Geo., Columbus.....	Vegetables
Heffner, D., Circleville.....	Horses	Kroft, Mrs., Columbus.....	Needlework
Henderson, James L., Washington.....	Cattle	Kraner, Mrs. K., Oberlin.....	Needlework
Henderson, W. R., Portsmouth.....	Horses		
Heintz, Mrs. S. A., Columbus.....	Painting	Kephart, G. H., harrows, Spencerville.	
Hills, Mrs. E., Delaware.....	Needlework	Kessler, Wm., wheel rack and tire cooler, Amanda.	
Hill, Caton, Johnstown.....	Sheep	Keystone Mfg. Co., corn planters, Sterling, Ill.	
Hillhouse, E. F., Columbus.....	Horses	Jno. Patterson, agent, Columbus.	
Hiskett, G. W., & Sons, Fulton.....	Cattle	Kilbourne & Jacobs Mfg. Co., road scrapers, Columbus.	
Hikes, Miss Belle, Columbus.....	Needlework	Kimberlin Mfg. Co., harrows, Indianapolis, Ind.	
Higgins, Mrs. Chas., Columbus.....	Needlework		
Handerschied, Mary J., Columbus.....	Alb. lace	Lawson, B. W., London.....	Horses
Hizas, Seeley, Ft. Ancient.....	Swine	Lampe Bros., Van Wert.....	Swine
Hoover, Mrs. E. A., Urbana.....	Cattle	Lawrence, M., Columbus.....	Vegetables
Holmes, Mrs. Wm., Marion.....	Preserves, etc.	Lake, W. M., Columbus.....	Milk stool
Housekeeper, G. C., Bowling Green.....	Fruit	Lacy, Mrs. M. P., Wilmington.....	Needlework
House, Mrs. M. J., Marion.....	Needlework	Langham, Wm., Belleville.....	Shells and coral
Hock, Mrs. E., Marion.....	Needlework	Levering, E., Baltimore, Md.....	Coffee
Horn, Mrs. W. E., Columbus.....	Brass work	Lewis, Robert, Columbus.....	Vegetables
Hunter, M. R., Avenue.....	Horses	Lee, Mrs. Chas., Gahanna.....	Needlework
Hunter, Lon, Morrow.....	Swine	Lewis, Mrs. Geo. W., Columbus.....	Needlework
Hurst, S. E., Elyria.....	Poultry	Lindsey, Jas., Madison Mills.....	Poultry
Hurst, Mrs. Fred., Chillicothe.....	Preserves, etc.	Linxweiler, Jacob, Dayton.....	Fruit
Hurst & Hurt, Chillicothe.....	Fruit	Livingston, A. W., & Bro., Columbus.....	Farm products
Huber, Mrs. C. A., Circleville.....	Flowers	Liggett, Mrs. M. J., Wooster.....	Child's bedstead
Hussey, John E., Col.....	Screens and painting	Lilly, Mrs. Capt., Columbus.....	Needlework
Hussey, Isaac, Columbus.....	Wash-boards	Logsdon, Jos., Sandusky.....	Horses
Hughes & Grierson, Columbus.....	Spiral springs	Lovejoy, Mrs. N. E., Col.....	Butter, bread, etc.
Hummer, Emma J., Marion.....	Paintings	Loffland, Miss Anna, Columbus.....	Flowers
Hull, P. G., Columbus.....	Musical instruments	Lybarger, A., Columbus.....	Horses
		Lynn, W. J. & B. M., Canfield.....	Horses
Halderman, S., cultivators, Kingston.			
Hanika Iron Fence Co., iron fence, Springfield		Lewis & Co., E. W., iron and wire material, Columbus.	
Hawes, O. M., General Agent, Stevens & Co., Norwalk.		Little Grant Plow Co., plows, Mansfield.	
Hench & Dromgold, cultivators, York, Pa., Morris Taylor, agent, east Rochester.		Livingston & Son, agents. C. E. Mann, Columbus.	
Hoosier Drill Co., grain drills, Richmond, Indiana, S. E. Shear, General Agent, Richmond, Indiana.		Long & Allstatter Co., cultivators and plows, Hamilton, Ohio. E. A. Stewart, General Agent, Hamilton, Ohio.	
Hotchkiss, S. S., General Agent, Wm. Deering & Co., Mansfield.		Loomis & Nyman, well drilling machines, Tiffin.	
Howard, W. S., General Agent, A. W. Coates & Co., Alliance.		Lorscheider, Mat., General Agent Minneapolis Harvesting Co., Columbus.	
Huber Manufacturing Co., steam engines and threshers, Marion.			
Hunt, E. E., farm gates, Willoughby.		Mason, J. J., Gallipolis.....	Horses and sheep
Hydraulic Press Co., cider presses, Mt. Gilead.		Mayfield, J. W., Delaware.....	Horses
Immel, John & Son, Columbus.....	Vehicles		
Irons, S., Lebanon.....	Fruit		
Irvin, Miss Lettie, Columbus.....	Needlework		

LIST OF EXHIBITERS—Continued.

<i>Name and post-office.</i>	<i>Articles exhibited.</i>	<i>Name and post-office.</i>	<i>Articles exhibited.</i>
Marfield & Bro., Chillicothe.....	Flour	Nelson, Miss Carrie.....	Needlework
Maxwell, Mrs. Mary, Reynoldsburg,	Butter, bread, etc	Neville, Mrs. M. D., Columbus.....	Painting
Marfield & Co., Chillicothe.....	Cooper's ware	Nixon, L. C., Ft. Ancient.....	Swine
Marhoner, Mrs. Dora, Columbus.....	Needlework	Niewenger, C. P., Springfield.....	Creamer
Marshall, Mrs. M., U. S. Barracks.....	Needlework	Noggle, John, Plymouth.....	Farm products
Matthews, Thos., Columbus.....	Paintings	Noggie, Rosie, Chicago, Ohio.....	Needlework
Megham, Bud, Columbus.....	Poultry	Newark Machine Co., manufacturer clover	
Miner, Miss Josephine, Columbus.....	Needlework	hullers, Columbus.	
Miller, J. T., Marble Cliff.....	Cattle and horses	Nichols, Shepard & Co., traction engines, Bat-	
Mischman, W. L., Bellefontaine.....	Cattle	tle Creek, Michigan. J. N. Patterson, State	
Miller, A. K., Pataskala.....	Horses	Agent, Mansfield, Ohio.	
Milikin, G. W., Youngstown.....	Cattle		
....., New London.....	Swine		
Mitchell, Frank, London.....	Horses	Obetz, Mrs. Chas., Reese.....	Preserves, etc
Mills, Jas., Updegraff.....	Sheep	Ohio Furniture Co., Columbus.....	Cabinet ware
Miller, Jas. M., Columbus.....	Vegetables	Ohlen, N. S. & Son, Streetsboro.....	Cattle
Miller, Miss Lizzie, Pataskala.....	Jelly	Ohlen, Jas. & Son, Columbus.....	Machinery
Miller & Bradley, Columbus.....	Stoves	O'Harra, Mrs. Geo. P., Columbus.....	Painting
Mitloff, Evans & Co., Columbus.....	Vehicles	Ohio Business University, Toledo,	
Miller, Miss Emma, Xenia.....	Needlework	Penmanship	
Miner, Mrs. L. M. C., Lithopolis.....	Needlework	Oliver, W., Kingstown.....	Fruit
Mock, J. L., Columbus.....	Poultry	Olverman, W. H., Hallsville.....	Farm products
Morrison, A., Taylor.....	Farm products	Oliver Chilled Plow Co., plows, South Bend,	
Morrison, C. M., Taylor.....	Flowers	Ind.	
Moore, C. G., Westerville.....	Washing machine	Osborn & Co., E. M., mowers and reapers, Au-	
Moehl & Pausch, Columbus.....	Wagon	burn, N. Y.	
Morgan, Mrs. E., Ashland.....	Needlework	Ottawa Gate Manufacturing Co., gates, Ot-	
Morgan, Mrs. C., Ashland.....	Needlework	tawa, Ohio.	
Machine and Steel Pully Co., cultivators, In-			
dianapolis, Ind.		Parsons & Black, Worthington.....	Cattle
Mast & Co., P. P. grain drills, Springfield.		Pryne, R. K., Parkman.....	Cattle
Mast, Roos & Co., wind mills, Springfield.		Paxton, J. G. & Son, Houstonville, Pa.....	Horses
Marlin, J. T., General Agent Milwaukee Har-		Palmer, J. G., Millersburg.....	Horses
vester Co., Columbus.		Paddock, Mrs. E. L., Delaware.....	Preserves, etc
Mayer, A. E., General Agent McCormick Har-		Park, Mrs. S. W., Hope.....	Preserves, etc
vesting Machine Co., Columbus.		Parsons, Miss L. A., Galion.....	Needlework
Mann, C. E., potato digger. Livingston & Son,		Parsons, Mrs. Chas., Galion.....	Needlework
agents, Columbus.		Plessinger, Frank, Beamsville.....	Swine
McCormes & Son, W. G., hayearner, Colerain.		Plessing, M. J., Millinsville.....	Horses
McCormick Harvesting Machine Co., reaper		Penny, G. W., Newark.....	Swine
and machines, Chicago, Ill. A. E. Mayer,		Perry, A. L., Mrs., Lewis Centre.....	Flowers
agent, Columbus.		Pfeiffer, John, Delaware.....	Fruit
McSherry & Co., D. E., grain drills, Dayton.		Phillips, Mrs. Mary, Col.....	Butter, bread, etc
Mechanicsburg Machine Co., grain drills,		Phelger, Mrs. J. D., Springfield.....	Needlework
Mechanicsburg.		Penfield, J. W. & Son, Willoughby.....	Machinery
Millson, John, General Agent Western Wood		Pierce, Mrs. C., Columbus.....	Needlework
Harvesting Machine Co., Columbus.		Pitts, C. D. & Son, Columbus.....	Boots and shoes
Milwaukee Harvester Co., mowers and reap-		Piersche, John N., Columbus.....	Paintings
ers, Milwaukee, Wis. J. T. Martin, General		Pond, Maynard, Logan.....	Cattle
Agent, Columbus.		Ponteus, Phil., Groveport.....	Horses
Minneapolis Harvester Co., mowers and reap-		Pollock, J. W., Cedarville.....	Cattle and sheep
ers, Minneapolis, Minn. Max. Lorscheider,		Postle, David, Camp Chase.....	Poultry
General Agent, Columbus.		Postle, F. L., Camp Chase.....	Horses
Miller, C. H., rubber bucket pumps, Colum-		Postle, F. D., Alton.....	Sheep
buss.		Powers, Edward, Marysville.....	Farm products
Moline Plane Co., plows, Moline, Ill.		Pool, Mrs. T., Reynoldsburg.....	Butter, bread, etc
Myers & Bro., J. E., pumps, Ashland.		Poling, John, Columbus.....	Potatoes
		Post, John, Columbus.....	Fruit
McGarry, P., Jamestown.....	Potatoes, etc	Powers, A. C., Perrysburg.....	Fruit
McBride, Miss Nancy, Pataskala,	Bread, butter, etc	Powers, Mrs. O. G., Newark.....	Silks
McCullon, Hallsville.....	Fruit	Prinx, Alice, Circleville.....	Needlework
McMurray & Faber, Marion.....	Vehicles	Price, Mrs. Alice, Columbus.....	Needlework
McBride, Miss Maggie, Pataskala.....	Needlework	Purdman and others, Dublin.....	Horses
McCoey, Miss Alice, Chillicothe.....	Needlework	Pugh, G. W., Basil.....	Horses
McDermith, W. H. & Co., Columbus,	Boots and shoes	Purdum, Mrs. J. W., Chillicothe.....	Fruit
McClelland, Miss Belle, Columbus.....	Flowers	Pugh, Miss Addie, Columbus.....	Flowers
McClave, Chas., New London.....	Poultry		
McDonald, Allen, Hookstown, Pa.....	Sheep	Patterson, John, agricultural implements,	
McBride, E., Allentown.....	Horses	Columbus, Ohio.	
		Patterson, J. N., State Agent, Nichols, Shepard	
National Sheet Metal Roofing Co., New York		& Co., Mansfield, Ohio.	
City.....	Roofing	Perrill, A. N., Agent Gholson Fertilizing Co.,	
Narse, Mrs. Will, Columbus.....	Needlework	Columbus, Ohio.	
Near, J. P., Urbana.....	Horses	Picketts, H., bricklayer's scaffold, Akron, O.	
Newton, J. V. & Co., Toledo.....	Horses	Pitts Agricultural Works, threshing engines,	
Newlove, J. W., Columbus.....	Bees	Buffalo, N. Y.	
		Plano Manufacturing Co., binders and mow-	
		ers, Plano, Ill. G. A. Diamond, General	
		Agent, Milan, Ohio.	

LIST OF EXHIBITERS—Continued.

<i>Name and postoffice.</i>	<i>Article exhibited.</i>	<i>Name and postoffice.</i>	<i>Article exhibited.</i>
Pyle, T. R., General Agent A. W. Wood Mower and Reaper Co. Mt. Vernon.		Stewart, Frank, Columbus.....	Horses
Quivey, J. M., Houstonville, Pa.....	Sheep	Stevens, F. C., Attica, N. Y.....	Cattle
Raisin, Robt., Columbus.....	Vegetables	Stillwell, J. W., & Co., Troy.....	Cattle
Rath, Jos., Columbus.....	Broom-hanger	Steddum, J. D., Wilmington.....	Horses
Rath, Mrs. J., Columbus.....	Needlework	Streeper, J. P., Chillicothe.....	Fruit
Reigle, Isaac, Cedar Hill.....	Cattle	Stimelh, H., Columbus.....	Fruit
Renick, Harness, Circleville.....	Cattle	Stubbs, A., Lebanon.....	Fruit
Richardson & McGrew, Westville.....	Swine	Stelzig, Miss, Columbus.....	Needlework
Renick, Mrs. Alex., Chillicothe.....	Fruit	Strotak, Miss Lena, Columbus.....	Needlework
Reinhart, Miss Tillie, Columbus.....	Needlework	Stewart, Mrs. C. E., Portsmouth.....	Painting
Richards, D. D., Newark.....	Cattle	Superior Roller Skate Co., Columbus.....	Skates
Rinehart, J., Marysville.....	Grain	Swickard, Lewis, Westerville.....	Farm products
Rideanour, Miss S. E., Columbus.....	Needlework	Swisher, H. C., Groveport.....	Farm products
Rohr, C. W., Groveport.....	Horses	Swartz, Miss Carrie, Columbus.....	Wax-work
Roth, C. A., Columbus.....	Flowers	Schauer, Smith & Co., hay rakes, Osborn, O.	
Royce & Pulling, Columbus.....	Machinery	Scheider Machine Works, traction engines, Newark, O.	
Rose, L. W., Columbus.....	Halters	Seiberling & Co., J. F., mowers and reapers, Akron, O.	
Robertson, Sarah, Columbus.....	Needlework	Seiberling, Miller & Co., mowers and reapers, Doylestown, O.	
Rumsey Bros., Westfield, N. J.....	Cattle	Sefton, W. E., General Agent, C. Aultman & Co., Mt. Vernon, O.	
Rundel, J. F., Birmingham, Mich.....	Sheep	Seiby, Yates & Co., grain drills, Peoria, Ill.	
Ruy, P., & Sons, Richville.....	Carving	John Patterson, Agent, Columbus.	
Ryant, F. L., Constantia.....	Horses	Sharpless, P. O., general Agent, Farmers' Friend Manufacturing Co., Marion, O.	
Ryan, Alice, Columbus.....	Painting	Shear, S. E., General Agent, Hooser Drill Co., Richmond, Ind.	
Richmond Check Rower Co., check rower, Richmond, Ind.		Smith, George T., Middlings Purifier Co., Jackson, Mich.	
Rock Island Plow Co., plows, Rock Island, Ill.		Smith & Amann, plows, Columbus, O.	
Rogers Fence Co., fences and harrows, Springfield, O.		Sohn-Ridge Implement Co., hay rakes, Hamilton, O.	
Robinson & Co., threshers and engines, Richmond, Ind.		Square-Hole Augur Co., Wooster, O.	
Roley, Adam, field-roller, Basil, O.		Stevens & Son, A. W., threshers and engines, Auburn, N. Y.	
Ross & Co., E. W., feed-cutter, Springfield, O.		O. M. Hawes, General Agent, Norwalk, O.	
Rude Bros. Manufacturing Co., grain drills, Liberty, Ind.		Stevenson Engine Co., steam engines, Upper Sandusky, O.	
Smith & Amann, Agents, Columbus, O.		Stoddard Manufacturing Co., harrows and mowers, Dayton, O.	
Russell & Co., engines and threshers, Massillon, O.		Staver, H. C., Implement Co., mill and horse power combined, Chicago, Ill.	
Scott, J. R., La Rue.....	Horses	Superior Drill Co., grain drills, Springfield, O.	
Schroeder, Paddock & Co., Campbells-town.....	Horses	W. M. Bentz, General Agent, Ashland, O.	
Scobey, Mrs. J. E., Col.....	Butter, bread, etc.	Syracuse Chilled Plow Co., plows, Syracuse, N. Y.	
Screyer, G., Columbus.....	Stoves		
Schrock & McDonald, Columbus.....	Vehicles		
Schille, Miss F., Columbus.....	Needlework		
Seely, M. B. & Co., North Farming Co., Mich.....	Cattle		
Seegar, Miss Nora, Columbus.....	Needlework		
Sherwood Novelty Harness Co., Syracuse, N. Y.....	Harness		
Shoemaker, D., Columbus.....	Swine		
Sharp, Jos. & D. K., Millersburg.....	Horses		
Seuff, M., Chillicothe.....	Fruit		
Shaffer, Miss Addie, Columbus.....	Wax-work		
Sites, Eugene, West Dover.....	Horses		
Sims, B. C., Groveport.....	Farm products		
Simson, Mrs. W. S., Columbus.....	Needlework		
Sked, J. F., Westerville.....	Flowers		
Slada, A., Shadysville.....	Swine		
Slade, Miss Olive, Columbus.....	Painting		
Smith, J. McLain, Dayton.....	Cattle		
Smith, J. L., New Carlisle.....	Horses		
Smith, Z. T., & Bros., Upper Sandusky.....	Swine		
Smith, Wm., Gambier.....	Horses		
Smith, N. L., Lindenville.....	Butter		
Smith, Miss Tillie, Columbus.....	Wax-flowers		
Smith, Miss Edie, Lindenville.....	Needlework		
Smith, Mary J., Lindenville.....	Needlework		
Snyder, Jno. S., Lancaster.....	Fruit		
Snider, Miss Mary, Columbus.....	Needlework		
Smith, Miss Ella, Columbus.....	Paintings		
Sprague, Mrs. W. R., Brice.....	Flowers		
Spencer, Harry, Columbus.....	Drawing		
Stimson, Mrs. W. S., Columbus.....	Needlework		
Stewart, Jas. R., Coshocton.....	Vehicles		
		Taylor, C. O., Urbana.....	Horses
		Taylor, Samuel, Pleasant Corners.....	Swine
		Taggart, E., Lewis Center.....	Butter, bread, etc.
		Thompson, J. H., Washington C. H.....	Horses
		Teachout, A., & Co., Columbus.....	Doors
		Tibbets, Fred., Columbus.....	Poultry
		Tidd, A. W., Lancaster.....	Painting
		Tippett, H., Columbus.....	Drawing
		Thomas, S. W., & Co., New London.....	Sheep
		Todd, S. H., Wakeman.....	Swine
		Todd, D. W., & Son, Urbana.....	Swine
		Toomey, S., & Co., Canal Dover.....	Vehicles
		Todd, Miss Florence, Columbus.....	Ceeroing
		Thomas, R. J., Cuyahoga Falls, O.....	Needlework
		Trimble, Mrs. L., Marion.....	Preserves, etc.
		Tryon, J. H., Willoughby, O.....	Fruit
		Troy Buggy Works, Troy.....	Wagons
		Turner, Henry, Pleasant Corners.....	Horses
		Tussing Bros., Canal Winchester.....	Potatoes
		Turnbull Wagon Co.....	Vehicles
		Turner, Mrs. Wm. N., Fairfield.....	Needlework
		Taylor, Morris, Agent, Hench & Dromgold, East Rochester, O.	
		Thomas & Sons, J. H., hay rakes, Springfield, Ohio.	
		Thomas Harrow Co., harrows, Geneva, N. Y.	
		Ubanks, C., Dublin.....	Horses
		University, O. S., Columbus.....	Cattle
		Urin, G. C., Columbus.....	Photographs

LIST OF EXHIBITERS—Continued.

<i>Name and postoffice.</i>	<i>Article exhibited.</i>	<i>Name and postoffice.</i>	<i>Article exhibited.</i>
Universal Plow Co., plows, Canton, O.		Williams, Mrs. C. P., Columbus.....	Carving
Valentine, J. H., Duval.....	Cattle	Williamson, C.D., Colum- bus.....	Musical instruments
Van Horn, T. B., & Co., Columbus.....	Cattle	Wolley, S. J., Hilliard.....	Cattle
Van Cleaf, A. R., Citeleville.....	Horses	Wooster, Miss Kate, Lancaster.....	Needlework
Vance, J. J., Ostrander.....	Horses	Woodruff & Cooper, Columbus..	Penmanship
Vance, J. B., Lockbourne.....	Horses	Wright, Mrs. Venice, Columbus..	Needlework
Vesey, Mrs. J., Groveport.....	Needlework	Woodward, Miss Sallie, Urbana..	Needlework
Vogel, Miss Maggie, Attica.....	Preserves, etc.	Wright, Mrs. B. G., Columbus.....	Paintings
Vogelgesang Furnace Co., Columbus.....	Stoves	Wayne Agricultural Co., grain drills, Rich- mond, Ind.	
Watson, Geo., & Son, South Charleston.....	Cattle	Watertown Steam Engine Co., steam thresher engines, Watertown, N. Y.	
Waples & Clelland, La Rue.....	Horses	Weir Plow Co., plows, Monmouth, Ill.	
Walker, C. C., & Son, New Madison.....	Cattle	Whitely, Fassler & Kelly, binders, reapers, and mowers, Springfield, O.	
Waddle, B., Marion.....	Cattle	Winchester Wire and Iron Works, Winches- ter, Ind.	
Waddle, F., Circleville.....	Horses	Wood, Walter A., Harvesting Machine Co., mowers and reapers, Chicago, Ill.	Jno. Mill- son, Agent, Columbus.
Waxwell, Hecker & Pomerend, Millers- burg.....	Flour	Wood, Wm. Anson, Mower and Reaper Co., Youngstown, O.	T. R. Pyle, General Agent, Mt. Vernon, O.
Ware, V. A. P., Reynoldsburg.....	Farm products	Xenia Public Schools.....	General work
Westbrook, O., Stantontown.....	Horses	Yates & Sons, Thos., Delaware.....	Cattle
West, Wm., Chillicothe.....	Fruit	Yardley, A. L., Columbus.....	Wooden ware
Webster, A., Clintonville.....	Fruit	York, Irvin Brock.....	Cattle
Whitmore, D. J., & Co., Casstown.....	Cattle	Ziegler, Hattie A., Columbus.....	Needlework
White, T. E., Millburg.....	Cattle	Zimmer, Miss E. L., Columbus.....	Needlework
Whipps Bros., Marion.....	Grain, etc	Zerkle, Mrs. J., Columbus.....	Flowers
Whitsell, Mrs. E., Columbus.....	Preserves	Zuck, Mary E., Columbus.....	Painting
White Sewing Machine Co., Co- lumbus.....	Needlework		
Willis, R. K., Lewis Centre.....	Horses		
Willis & Staley, Lewis Centre.....	Sheep		
Williams, W., and others, Columbus.....	Horses		
Willson, F. R., & Son, Columbus.....	Vehicles		
Wilson, J. N., North Fairfield.....	Churn		
Wilhelm, Jno., Wooster.....	Churn		
Wilcox Manufacturing Co., Gar- rettsville.....	Evaporators		
Willard, Miss Alice, Columbus.....	Painting		

REPORT ON THE HORSE EXHIBIT.

BY J. J. ALLISON.

To the Ohio State Board of Agriculture:

As Reporter of awards on horses for the year 1885, I submit the following: In comparison with former years, and in fact, the Horse Department of the Ohio State Fair of 1885, was a complete success. A large number of additional stalls was required to meet the demand. The management was satisfactory, and the decisions of the judges were seldom unpopular. The draft horses were best represented. The interest in this class has taken great prominence in our State for the past few years, and other classes have been neglected. The tide is turning, and soon the general purpose horse will be foremost, yet the draft horse will hold a high rank.

Almost all the competition is among the stallions. There are many mares in Ohio superior to those at the State Fair. The stock men, and particularly the farmers, should bring their best horses, not so much to secure a premium, as to increase the interest in good stock and improve the condition of these, our most faithful servants. While the horse is the most valuable property, he is also the most abused by the majority of owners.

THOROUGHBREDS.

The "common horse" has eclipsed this class. The only four-year-old stallion exhibited took the first premium. Waverly, Jr., is owned by Joseph Logsdon, Upper Sandusky, Ohio. He is a dark bay, $16\frac{1}{2}$ hands high, weighing 1065 pounds, sired by Waverly, dam, Callduck. He is a fine horse, with a record of 1:44.

Without competition, the three-year-old stallion Dud took first premium; he is owned by John H. Thompson, Washington C. H., Ohio, sired by Chillicothe, dam, Sirene. He is a dark brown.

John Alexander, the only two-year-old shown, took first premium; he is owned by W. Williams, Columbus, sired by Kyrle Daly, dam, Nettie Gwynne. This gray colt promises a good future, having taken first premium in the two-year-old race.

In class of one-year-old stallions, the only colt shown took first premium; he is owned by J. M. Ackerman, Columbus, sired by Kyrle Daly.

Mares four years old and over.—Of the two shown in this class, Lady Reber, owned by J. H. Thompson, Washington C. H., took first money. She is a dark bay, sired by Hurrah, 16 hands high, weighing 1200 pound?. She is a fine mare and very fast, taking first money, best two in three in the mile race. The second premium was awarded to Westfall, owned by F. R. Stuart, Flint, Ohio, she was sired by Hurrah, dam, Regards; she took second money in the two-mile race of 1884.

Mares three years old and under four.—Two were shown. The first premium was awarded to Faith, owned by W. Williams, Columbus; she was sired by Hurrah, dam, Nellie Gwynne, is $15\frac{1}{2}$ hands high, and weighs 900 pounds. The second premium was given to Palie, owned by Charles Brossman, Lithopolis, Ohio, sired by Kyrle Daly, is a bay $15\frac{1}{2}$ hands high, and weighs 900 pounds.

Mares two years old and under three.—Of the two shown, Grace Lee, owned by W. Williams, Columbus, took first premium. She is a bay, sired by Kyrle Daly, dam, Louisa Gwynne. She promises great speed, taking second money in the two year-old race. The second premium was awarded to Faith Thompson, owned by John H. Thompson, Washington C. H. She is a brown filly, sired by Chillicothe, dam, Ada H.

The one-year-old filly, Belle of Marion, took first premium without opposition; she is owned by Noyes & Irwin, Marion, sired by Grenada, dam, Belle of Nelson.

Louisa Gwynne, the only brood mare with foal at her side, took first premium; she is owned by Henry C. Taylor, Columbus, sired by Hurrah, dam, Nellie Gwynne. She is eight years of age, 15 hands high, weight 1000 pounds. The colt is a chestnut, sired by Grenada, a famous horse, winner of Saratoga, Belmont, etc., stakes.

ROADSTERS.

In this class, a fine display was made. It was an inspiring sight to behold the action of these noble horses, and the skill of their drivers.

Stallion four years old and over.—There were six exhibits. The first premium was awarded to Ambassador, a famous black, owned by Harris & Williams, Upper Sandusky. He was sired by Geo. Wilkes, dam, American Boy; he is ten years old, 16½ hands high, and weighs 1275 pounds. Ambassador has all the points of a roadster in an unusual degree, most prominent of which is his endurance and speed, having a record of 2:25. He has taken many premiums, and was, without doubt, the best horse upon the grounds, if not in Ohio.

Maitland, Jr., owned by B. W. Lawson, London, Ohio, took second premium; he is a blood bay, 16 hands high, weighing 1225 pounds; enormous bone and long stride. Maitland, Jr., is an inbred Messenger on both sides, sired by Maitland, dam, Josie Turner. He has taken many premiums, and could find his superior only in Ambassador. He is of the same stock as Maud S, and shows great speed and endurance.

Stallion three and under four years.—Four were shown. The first premium was awarded to Happy Hinkle, owned by A. H. Underwood, London, Ohio, sired by Happy Traveler, dam, Lady Hinkle. He is brown, 15½ hands high, weighing 960 pounds. The second premium was given to a horse owned by Frank Wardell, Circleville, Ohio.

Stallion two years old and under three.—Of the four exhibits, Garfield Moore carried off first honors. He is owned by C. C. Smith, Plain City, and is a well developed bay colt, 16 hands high. The second premium was given to Deceiver, owned by A. L. Grover, Mechanicsburg.

But one colt, in the one-year-old class, was considered, although several superior ones were entered. The judges thought it an oversight in the State Board to require this class to exhibit in harness, yet they could not admit any without it. "J. B." deserved first premium. He is owned and was bred by P. G. Palmer, Millersburg, sired by American Boy (see description under "stallions with five of his colts"), dam, Luke's Hiattoga. He is a sorrel, with nice open gait. Jessie M. Elliott, Alton, had a fine colt that was also rejected. The first premium was awarded to Archibald Chief, owned by Wm. J. Smith, Gambier, sired by Robin Hood. He is a large, light bay, 15 hands high.

Mare four years old and over.—Under this class, eight fine mares were shown, by far the best exhibit of mares on the ground. The first premium was awarded to a sorrel mare, owned by Jonas Pickens, Circleville. The second premium was given to Kissie, owned by L. G. Delano, Kinnikinnick, Ohio. She is a good style brown, four years old, 15½ hands high, weighing 1025 pounds, sired by Knickerbocker.

Mare three years old and under four.—Of the three of this class, Lady Light-foot carried off first honors. She is owned by M. L. Burnham, Mechanicsburg, sired by Joe Hildreth. She is a beautiful chestnut sorrel, weighing 950 pounds. The second premium went to Linnet, sired by Col. Moore, and owned by C. C. Smith, Plain City.

Without competition, a two-year-old filly, Sada B, took first premium; she is owned by A. R. Miller, Pataskala, sired by Pennypark, dam, Eagle Pilot. She is of great beauty, and straight and worthy.

One-year-old filly.—Fanny Frost, owned by P. G. Palmer, Millersburg, deserved first premium, but was not considered by the judges, because she was shown without harness. She is a superior colt, sired by American Boy, dam, Scott's Hiatoga; she has fine action, and promises to be a trotter. The first premium went to Emma Abbott, owned by A. R. Miller, Pataskala, sired by Pennypack, dam, Eagle Pilot. She is a bay with white feet, weighs 600 pounds, and has speed for a colt. The second premium was awarded to Vici, owned by John C. Hana, Groveport, and sired by Schuyler Colfax.

Mare with foal at side.—The first premium went to Sada Thayer, owned by F. L. Postle, Camp Chase; she is an extra dark bay, weighing 1000 pounds. The colt is by Pennypack. The second premium was given to a mare owned by A. R. Miller, Pataskala.

HORSES FOR GENERAL PURPOSES.

Stallion four years old and over.—In this important class there were thirteen entries and ten exhibits. Seldom does it fall to the lot of man to behold a finer sight than these spirited, blooded, and perfect horses. Every horse was worthy of a premium. The judges awarded the first premium to Galvados, owned by Armstrong & Stanly, Alliance, imported from France, in 1885, by J. H. Dolman, New York. He is French Coach, dapple bay, weighing 1300 pounds, 16½ hands high. He has high action, perfect development, and justly takes the first premium wherever he is shown. The second premium was given to Clifton Caief, owned by John Beal, Port Williams, by Old Risk Hambletonian, dam, Lady Starr. He is a dark bay, 16½ hands high, and weighs 1100 pounds.

Stallion three years old.—Of the seven entries and four exhibits, Willoughby took the first premium. He is owned by F. L. Bryant, Constantia, sired by Willoughby, dam, Nell. He is a dark bay, 15¾ hands high, and weighs 1060 pounds. He is of Messenger and Red Eagle stock. The second premium was awarded to Frank Herod, owned by Dwight Gay, Columbus, by Yorkshireman; a dark, bay of good size and action.

Stallion two years old.—Of the four shown, Wonderful took first money; he is owned and was bred by Frank M. Jack, Lebanon, by Wonder, dam, Minnie. Wonderful is a rich, dark bay, 15¾ hands high, and weighs 1050 pounds. He is of Hambletonian stock, and as his name indicates, a choice horse with almost perfect development in every point. His style and action attract the admiration of all. The second premium was awarded to Diamond Joe, owned by R. W. Purdum, Dublin, by Robin Hood, dam, Nettie Moore. He is a bay, with good size.

Of the two one-year-old stallions, Lord Derwent took first premium; he is owned by Bell Brothers, Wooster, and imported by them, January, 1885; sire, Emperor, dam, Michael. He is a rich bay, of good size, extra size and movement, and one of the best colts on the ground. Blueback took the second premium; he is owned by Koerner, of Alton; by Bellefontaine; bay, and promises to be a fine horse.

Mare four years old and over.—There were three shown in this class. Maud took the first premium. She is owned by S. D. Steddon, Wellington; by Stra-

der's Hambletonian, dam, Minnie. She is 16 hands high, weighs 1150 pounds, and has good action and style. The second premium was given to a mare owned by W. R. Henderson, Portsmouth.

Mares three years old.—Without competition, Julia Thomas, owned by R. W. Purdum, Dublin, took first premium; she is a beautiful bay, 15 hands high, and weighs 1000 pounds. She took first premium in 1883.

Nellie, the only exhibit of a two-year-old, was awarded first premium. She is owned by C. Ubanks, Dublin; by Robin Hood. She is a red bay, of good size, and took the first premium in 1884.

There were three one-year-old fillies shown, of which a black, owned by W. R. Henderson, of Portsmouth, took first premium. She has good style and movement.

The second money went to Minnie Hawk, owned by A. R. Miller, Pataskala; by Pennypack, dam, Scott's Hiatoga. She weighs 600 pounds, and shows speed and beauty of movement.

Brood mare with foal at side.—Five exhibits were made. The first premium fell to the lot of Net, owned by B. F. Elliott, Alton; by Hurrah. She is eight years old, a dark bay, and has proven a superior breeder. Colt sired by Sandy Rocket. Nettie Moore took second premium; she is owned by R. W. Purdum, Dublin; by Charles Arthur's Lexington. She is nine years old, and of good size. Colt sired by Robin Hood.

CLYDESDALE AND ENGLISH DRAFT HORSES.

The majority of horses in this department were Clydesdale, although some fine English horses were brought out. Exhibitors made a mistake in showing a fast gait instead of the walk of their horses. A walk of four miles an hour with a fair load, is far superior to one of three miles, and breeders should take this into account.

Stallion four years and over.—In viewing the nine horses shown, it would seem that draft stallions were brought to perfection. It is surprising to see the action of these immense horses. The competition was great, and it was by the most critical examination that the judges could make a choice. The first premium was awarded to Ben Loman, imported in 1882, owned by C. D. Taylor, Urbana, sired by Lord Glamis. He is $16\frac{1}{4}$ hands high, weighs 1750 pounds, is a Clydesdale, bay, five years old, and is of extraordinary power. The second premium went to Imperial, imported in 1881, registered in Scotland and the United States. He is owned by J. P. Neer, Urbana, sired by Sir Colon (777); a brown, seven years old, 17 hands high, weighing 1950 pounds. He has extra bone, action head, and neck.

Stallion three years old.—Five were shown. The judges disagreed upon first premium, but finally it went to Robin the Laird, owned by Swisher, Paddock, & Co., Campbellstown, and imported by them in 1884. He is a clear bay, with white face and feet, $16\frac{1}{2}$ hands high, weighing 1900 pounds, and is well proportioned. The second premium was awarded to Kildonan, imported and owned by Swisher, Paddock, & Co. He is similar to Robin the Laird, with superior muscle and movement.

Stallion two years old.—Three were shown. Tom, owned by Lester Bidwell, West Jefferson, took first money. He is imported, is of Clydesdale stock, with large bone, well developed muscle, and large for his age. The second premium was awarded to Good Luck, owned by Bell Brothers, Wooster, and imported by them in July, 1885; register number 368. He is English, bay, with white limbs and feet, $15\frac{3}{4}$ hands high, weighing 1300 pounds. He is powerfully built, with extra limbs and muscle. Without doubt, he would have taken first premium, had it not been for his white feet and limbs.

Stallion one year old.—Five colts were exhibited. The first money was given to Coinage, imported and owned by Bell Brothers, Wooster. He is a beautiful bay, 15 hands high, weighing 1100 pounds, fine head and good legs. Golden Drop, owned by Bell Brothers, took second premium; he was sired by Stony Hook, a bay, 15½ hands high, weighs 1200 pounds, superior action and style, good bone and flat legs.

Mare four years old and over.—There was quite a contrast between this class and the stallions, as only three mares were shown. The first premium was awarded to Bay Nellie, owned by James Mahon, Mansfield; by Honest Tom, dam, English Glory. She is imported, a dark bay, six years old, 17 hands high, weighing 1900 pounds; she is a breeder. The second premium was given to Doll, owned by J. S. Bower, Plain City; by Robert Bruice, dam, Nan, a bay, seven years old, weighing 1700 pounds. She is three-fourths Clydesdale, and is an extra breeder.

Mare three years old.—Of the two in this class, Coly, owned by J. S. Bower, Plain City, took first premium; she was sired by Dr. Livingston, dam, Doll, seven eighths Clydesdale, a beautiful black, weighing 1600 pounds. She is a very fine mare, having taken first premium in 1883. The second money went to Clyde, owned by W. R. Hunter, Avenue; she is black, 16 hands high, and weighs 1400 pounds.

Mare two years old.—Two exhibits. Tidy Bay, owned by W. L. West, Marengo, Ohio, took first premium; sired by Perfection, dam, Nell, 15½ hands high, weighing 1500 pounds. She has heavy bones, and rather short limbs. The second premium was awarded to a mare owned by Lester Bidwell, West Jefferson.

Filly one year old.—Without competition, the first premium was awarded to Melinda, owned by N. L. West, Marengo; sired by Perfection, dam, Bally. She is full bred Clydesdale, with good style.

Brood mare with foal at side.—Of the two shown, Cub, owned by B. B. Bowdre, New Dover, took first premium; she was sired by Kap Downey, dam, Cub, 16 hands high, weighing 1550 pounds, seven eighths Clydesdale. The second premium was awarded Clyde, owned by John Koerner, Alton. She is six years old, one-half Clydesdale, and weighs 1500 pounds.

PERCHERON AND NORMAN DRAFT HORSES.

This department was as well, if not better, represented than the Clydesdale and English Draft. Nearly all were imported, and of the very best quality and condition.

Stallion four years old and over.—There were ten shown, and of the whole number, there was not one inferior horse, all being worthy a premium. The first money was given to Hercules, imported in 1884, owned by Dr. J. K. Scott, La Rue, ten years old, gray in color, in height 16½ hands high, weighing 1880 pounds. He has excellent action and style, and took first premium and sweepstakes in 1884. The second premium was awarded to a horse owned by Wm. C. Baum, Duvolt, Ohio.

Stallion three years old.—Two were shown. The first premium was awarded to Ohio, owned by Swisher, Paddock, & Co., Campbellstown, and imported by them in 1884. He is a fine gray, 16½ hands high, and weighs 1700 pounds. He has heavy bone, good style, and superior action. The second premium was given to Kildonan, owned by Davis & Smith, Canaan, Ohio, imported by Swisher, Paddock, & Co. He is a brown, with white face and feet, weighs 1700 pounds, and 16¾ hands high.

Stallion two years old.—Both colts shown were excellent. The first premium fell to the lot of Sedan, owned by W. R. Hunter, Avenue; by Valor, dam,

Grisettee, a dapple gray, 15 hands high, weighing 1300 pounds. He is a full bred, well developed, powerful colt, and took first premium in 1884. The second premium was awarded to Favorite, owned and imported by Swisher, Paddock & Co., Campbellstown. He is large for his age, weighing 1600 pounds. He has a well developed front, and extra style and action.

Stallion one year old.—Four in this class. Duke, owned by J. J. Vance, Ostrander, Ohio, took first premium; sired by Butot, dam, Mollie. He has fair action and style. The second premium was awarded to Wm. Curtis, owned by M. J. Pegg, Mifflinville; sire Gen. Rosecrans, dam, Dolly.

Mare four years old and over.—Without competition, Adeal, owned by T. J. Miller, Marble Head, took first money; she was imported in 1883, by Dunham, of Illinois. She is large and fine, and deserved the premium.

J. T. Miller exhibited the only three year-old mare, and took first premium; she is a steel gray, by Livingston, dam, Norman.

The one-year-old filly, Ada, took first money without opposition; she is owned by Orville Westbrook, Stantonville. She is an imported dapple gray, of good size; she took first premium in 1884.

Mares with foal at side.—Margantha, owned by J. T. Miller, Marble Cliff, took first premium; she is a large brown, and full bred. The second premium was awarded to Margaretta, owned by J. T. Miller; she is of good size and shows a fine colt.

GELDINGS AND MARES FOR LIGHT HARNESS.

Mare or gelding four years old or over.—With few exceptions, the eight exhibits were fine. The interest in the contest was intense. Frank M, a large, peculiar colored bay, took the first premium; he is owned by Frank M. Jack, Lebanon, and is very attractive. The second premium was awarded to a horse owned by W. W. Freeman, Columbus.

Five were shown in the three-year-old class. Maud L, owned by A. Lybarger, Columbus, carried off first honors; she is a beautiful bay, sired by Almont Gift, weighs 1100 pounds, is 15 hands high. Her superiority is in her movement and endurance. The second premium went to a horse owned by C. C. Smith, Plain City, Ohio.

SADDLE HORSES.

Seven contested for honors in this class. There was no question about the first premium. It was awarded to Selim, a light gray stallion owned by J. J. Maxon, Gallipolis; he is a noble horse, beautiful and gentle. Selim was sired, by Gray Selim, dam, Kate Smith, is 15½ hands high, and weighs 1125 pounds; his movement is natural and smooth in all gaits; he is a fine roadster, having a clear, even trot; he has repeatedly taken premiums at the Virginia State Fairs and elsewhere. The second premium went to Bruce, a gelding owned by J. B. Vance, Lockbourne; he was sired by Bruce, weighs 1000 pounds, and is 15½ hands high; he has good style, and is a fine horse.

MATCHED HORSES AND MARES.

Pair of coach geldings or mares.—Without competition, the first premium was awarded to a pair of bay geldings, owned by Daniel Stein, Circleville. They were well matched, six and seven years old, 16½ hands high, and weighs 1225 and 1235 pounds.

Pair farm or draft geldings or mares.—But two were shown, of which a large bay team, owned by John Metzger, Circleville, took first premium. Weight, each, 1600 pounds; height, 17 and 17½ hands high; they were well matched.

The second premium was awarded to a pair of blacks, owned by John Koerner, Alton; they were six years old, and weighed 1500 and 1410 pounds.

Pair light harness geldings or mares.—Three exhibits. A. R. Appleman's team, of Columbus, took first premium. Orville Westbrook, Stantonville, took second money.

SWEEPSTAKES FOR THOROUGHBREDS.

Best thoroughbred stallion of any age.—Waverly, Jr., owned by Joseph Logsdon Upper Sandusky, took first premium.

Best mare of any age.—There were five entries. Grace Lee, owned by W. Williams, Columbus, took first premium. For description, see Thoroughbreds.

CLYDESDALE AND ENGLISH DRAFT SWEEPSTAKES.

Best stallion of any age.—There were six as good horses shown as are to be seen anywhere. Alexandria carried off the honors; he is owned by Waples & Cleveland, La Rue, imported by Guthrie & Moore, Marion, Ohio, in 1884; sired by Reading, dam, Fanny Compton. He is a dark chestnut, with white feet, Englishshire, register number 2521, and weighs 1950 pounds.

Best mare of any age.—Bay Nellie took the honors. For description, see Clydesdale and English Draft.

PERCHERON AND NORMAN DRAFT SWEEPSTAKES.

Best stallion of any age.—Eight immense horses were entered. Hengis, a dapple gray, seven years old, $16\frac{1}{2}$ hands high, weighing 1960 pounds, took the premium. He is owned by J. V. Newton, Toledo; was sired by Chere that won first prize at the Paris Exposition in 1878; imported in 1881 by M. W. Dunham, of Illinois.

GENERAL PURPOSE AND ROADSTER SWEEPSTAKES.

Best stallion, to be exhibited with five or more of his colts.—But one entry was made. American Boy well deserves the honors; he is owned by P. G. Palmer, Millersburg, and sired by Starr Hambletonian. He is a beautiful dark chestnut, 16 hands high, weighing 1200 pounds, heavy bone, fine neck and superior action. The colts were chestnuts, J. B. and L. P., being described under Roadsters.

Best stallion of any age.—A fine lot were shown in this class. Maitland, Jr., took the premium. For description, see Roadsters.

JACK AND MULES.

Pair mules three years old and over.—There were two entries. The first premium went to the bright bays, owned by H. W. Ewalt, Rich Hill; they were well matched, good bone and muscle, 16 hands high, and together weigh 2300 pounds. The second premium was awarded to a pair owned by Thomas Brundige, Kingston; they were nine years old, weighing together 2300 pounds, large fine mules, but not well matched. Of this pair, one took the first premium for best single mule, three years and over.

REPORT OF THE CATTLE EXHIBIT,

OHIO STATE FAIR, 1885.

BY DR. J. S. R. HAZZARD.

To the Honorable State Board of Agriculture:

GENTLEMEN: As a reporter for the Cattle Department of the Thirty-sixth Ohio State Fair, I entered upon my duties as an observer of facts and chronicler of events most conducive to the end sought by this exhibit, to-wit: To interest and instruct farmers by means of object lessons in one of the most important departments of agriculture. We have reached a point in our industrial history that gives unusual importance to cattle husbandry. The sharp and almost ruinous contraction of values in most of farm products has wrung from the farmers all over this country a wail of distress, unequalled for its depth of pathos and inspiration of truth, and, but for a more cheerful refrain coming from the cattle industry, agricultur would be most discouraging. Beef, the best quality of beef, has commanded a remunerative price, while common and scrub stock have been reared and sold at a loss. It becomes, therefore, an important mission of the exhibitor to teach the farmer how he can rid himself of the burden his unthrifty scalawags have imposed, for lo these many years, and where the highest type of stock can be procured. We have, in Ohio, 2,000,000 of cattle, a large per cent. of which is the commonest sort, a handicap upon the toil of their owners; hence every gradation upwards made by thoroughbred stock add millions to our tax duplicate, and sets forces in motion that lifts mortgages from homesteads, brings sunshine into households, and elevates the whole body politic to a higher plane of civilization. The State has wisely provided this Fair as the school, and the forty-six exhibitors here present, have assumed the responsibility of demonstrating to the people by the exhibition of 335 head of cattle, of the several breeds, what great possibilities lie within the reach of every farmer, if he will but follow intelligently the teachings of experience.

The number of cattle on exhibition this year is not quite up to last year. Shorthorns this year drop off 13 head; Herefords lose 22; Devons 1 less; Polled breeds lose 7 head; Jerseys 10 head, while the Ayrshires gain 10 head, and the Holstiens add 31 head to their number. The fat cattle exhibit numbered 11 this year to four last year. In point of quality, all the various breeds are quite up to the standard of excellence presented in 1884.

There is manifestly an effort being made by Shorthorn breeders to wipe out the red color craze; more roans, and red and white were to be seen in the several exhibits, than for a number of years past, while Mr. Renick had the courage to put in the exhibit a pure white yearling bull. Mr. Renick's disre-

gard for an absurd and demoralizing prejudice should be hailed by all lovers of the Shorthorn breed as the dawn of a better era, disenthralled from the shackles of a fashion that taboos every animal, however superior his points of excellence may be, if he should happen to be white, and takes the nearest approach to the true type of Southern excellence as his beacon light. These remarks are also applicable to the other breeds, if dominated by a senseless fashion that threatens to destroy its useful qualities.

The meteorological conditions during the present fair, as compared with that of 1884, are sharp, making one almost shiver from cold this year, while last year an oppressive heat enervated the nervous system to threatened exhaustion. But whether cold or hot weather prevails, the people come to the Fair, and show unmistakable interest in the improvement of live stock, which this great exhibit so forcibly demonstrates.

I cannot forgo, even at the risk of being thought impertinent, to speak of the utter impossibility to do justice in my report of the cattle in the show ring, when two or more classes of different breeds are being examined by their respective committees at the same time. I would love to carefully examine every animal of every breed put on exhibition, and impartially report the good points possessed by each individual, and note the reasons why the committee place a badge of excellence on one animal to the exclusion of another, which the novice may deem its superior. But under the present regime, all such particularity is precluded, and will remain impracticable until some plan can be devised to secure the prompt attendance of committeemen, thereby enabling the member in charge to commence his labors as stated in program.

August 31. 1885. After the usual delay from causes above mentioned, the Thirty-sixth Ohio State Fair was formally opened by calling for milking cows of any age or breed.

Mr. F. C. Stevens, Attica, N. Y., responded by leading Rhoda and Jewel into the ring, and J. W. Stillwell & Co., Troy, O., presented DeViries and Bastine as competitors, a quartette of Holstienes. Alas for the Shorthorn, how completely is she disfranchised, and her crowning excellence obscured. These Holstienes are fine representatives of their breed, and, of course, each showed the milking formation in a good degree, making it difficult for the experts to place the honors. But, after much deliberation. Mr. Stevens' Jewel was accorded the first premium, and Mr. Stillwell's DeViries, the second premium.

The best butter cow of any age was then called. Mr. G. M. Hoover, Urbana, O., pitted his Jersey, Princes Imperial, against Mr. Stillwell's Holstiens, DeViries and Castine, DeViries winning the first premium, the little Jersey, the second. Princes Imperial, has all the characteristics of her breed well developed, and in her blood the aristocracy of the race are focalized.

The challenge made for the best milking cow, under three years old, was accepted by Mr. F. C. Stevens, by placing Tirannia in competition with Mr. Stillwell's Yeager Key and Metje Hartog, all Holsteins, and first rate cows, but Tirannia was adjudged the best, and Metje Hartog her second.

The fat cattle ring was unusually large and of good quality. Mr. E. Coon and Mr. B. Waddel, both from Marion, O., each had a very good three year old bullock. Mr. Coon's, Dan Webster, (a grade Shorthorn), weighing 2,217 pounds, is three years and eleven months old, fed during August and made a gain of 7.54 pounds per day. Mr. Waddel's, Dan, a thoroughbred Shorthorn, is just three years old, and weighs 1,940 pounds, has been fed all the time on boiled ear corn, and has made an average daily gain of 1.77 pounds. These are good steers, and creditable to the skill of their feeders, but Dan's extra feed, so accelerated his growth and ripeness, that Mr. Coon's Dan Webster, was assigned the second place.

In the two-year-old class, Mr. Coon enters Dandy, roan, two years old 29th January, 1884, weighs 1,682 pounds, fed as was Dan Webster, and made a daily gain of 1.78 pounds, is a splendid handler. His competitor is Mr. G. W. Hiskett's Jumbo, a high grade Shorthorn, red, two years old the 26th of March, 1884, weighs 1,730 pounds, raised by hand, fed on shelled corn and bran, since July last, fed on meal and bran, one peck per day, and has made a daily gain of 1.94 pounds. Here again, extra feed tells, for Jumbo wins the red ribbon, despite the natural advantages possessed by Dandy. He wore the royal blue, however, very gracefully.

The yearling class was composed of Mr. Blanchard's Shimmie, a roan, weight 1,425 pounds, average daily gain, 2 11 pounds; Colonel, roan, weight 1,275 pounds, average daily gain, 2 25 pounds; Bloom, roan, weight 1,360 pounds, average daily gain, 1.94 pounds; Reno, roan, weight 1,342 pounds, average daily gain, 1.89 pounds. Mr. Hiskett's Criswell, whose average daily gain was 1.83 pounds, and Mr. Waddel's Orio, roan, whose average daily gain reached 2.23 pounds. Here is a half dozen roan Shorthorns, that one loves to feast his eyes upon, and speculate as to their future outcome, but the committee has settled their present relative standing by tying the red ribbon on Colonel and the blue ribbon on Orio.

Mr. F. H. Johnson, presents a grade Hereford cow, dropped a calf last March, is a right handsome four-year-old, and I should think will kill well. First premium.

Mr. J. McLain Smith, Dayton, O., exhibited a herd of very good Red Polls. so good indeed, that they deserve more than a passing notice. They are a little under size, but because of their excellent milking quality, combined with a tendency to take on flesh, they approach the ideal general purpose breed. Duke of Dayton, a three-year-old, weighs 1,455 pounds, and is a blocky beast of the true red doddie sort. Imperial Ruby Rose, is a four-year-old, has dropped three calves, has not been dry since her first calving, gives an abundance of milk, but yet preserves a good symmetry. Lady Blanche is fairly good as an individual, but is an extra milker. Beauty 5th, a two-year-old, promises much as a milker. Cora and Lulu are yearlings; Cora will make a good size cow. Bachelor is a nine months bull of fair promise. There being no competition, they were severally awarded a premium.

Mr. Garringer, Washington C. H., exhibited his herd of Aberdeen Angus. They were described in last year's report. They, too, received premiums without opposition. Mr. Garringer has evidently taken good care of his black pets, and they have made satisfactory response in growth and every doddie grace.

The next breed to claim our attention is the Friesian Holsteins. They appear to be rapidly multiplying in our country, and are being forced to the front, not only as the best possible milk and butter producers, but are found at the Chicago Fat Stock Show contending for a standing among the recognized beef breeds. How well they have sustained the claim is now a matter of history; and needs no comment here, but they are formidable in numbers, abundant in excellence, and cursed with unspeakable names.

The competitors in the aged bull class are: I. B. Gibbs, Cleveland, O., Ichabod Crane; M. R. Seeley & Co., North Farmington, Mich., Young Kenia; F. C. Stevens, Attica, N. Y., Constantyn; T. Gates & Son, Delaware, O., Oneida, French & Bros., Cincinnati, O., International Prince; J. L. Henderson, Washington, Penn., McKean; J. W. Stillwell, Troy, O., Jacob and Prince Tuisk.

These animals show unmistakable traces of their Friesian origin, and from that standpoint it is difficult to determine which is the best, but all things considered the committee concluded that Constantyn should wear the red, and Oneida the blue.

In the two year-old bull class, Mr. Yates & Son entered Sir Archie; Mr. Henderson, Cornelis; Stillwell & Co., Promoter and Jacob 3d; and Mr. Stevens, Prince of Oakwood. This is a lot of good ones individually, and if bred on cows with beefy proclivities would make a first class general purpose animal, just such as the average farmer needs. Promoter and Sir Archie received the honors in the order named.

The yearling bull class is made up of Seeley & Co.'s Ykema 2d; Stevens' Henry of Maplewood; Gates & Son's Allison; French & Bros.' Nameless, and Stillwell & Co.'s Gort. This is a pretty fair lot of youngsters; perhaps the American bred Holsteins have a tendency to smoothness of contour unattainable in their ancient home. Ykema 2d won the blue, and Henry of Maplewood the red ribbon. The same exhibitors each enter a bull calf, several of which are without a name. They certainly show no signs of degeneration, but maintain the type of the parent stock. Mr. Stevens' Prince Raoul took first premium, and Henderson & Bros.' McKean 2d, the second premium.

Sixteen aged Holstein cows enter the arena. They are not fat, as no great milker can be, but their form, and every visible characteristic of superb dairy cows are marked and prominent. The large and faithful discharge of duty at the pail shows an incipient decrepitude, more or less pronounced in several, but from a dairyman's standpoint, they are a grand lot of cows. Seeley & Co. enter St. Anna; F. C. Stevens shows Jewel, Rhoda, ———, Anelete, and Lutscke; Yates & Son, Vrieud and Widow Bedott; French & Bros., Lady Philpail and two others; J. L. Henderson, Gustina and Betsse; Stillwell & Co., Pride Tuisk, Devices, and Castine. Twelve of this lot were imported and consequently the best that could be procured from their native herds. Mr. Stevens' imported Jewel and Lutscke were the committee's favorites.

The call for the two-year-old Holstein cows brought out Seeley & Co.'s Hui-zewer; Stevens' Offinga, Tirannia, and Christina; Yates & Son's Lady Nae; French & Bros.' Jodin and Philpail 1st; J. L. Henderson's Zavel and Vellure 2d, and Stillwell & Co.'s Metje Hartog and Yeager Key. Good, every one of them, and promise much future usefulness; however, Tirannia was adjudged the best, and Lady Nae her second.

A lot of eleven yearling heifers were next examined, in which Seeley & Co. placed Maid of Springbrook; Stevens, Lady Echo and Hollander; French & Bros., Philpail 3d, Bearla, Fair Kate, and Durkje; Henderson Bros., Betsse, and Stillwell & Co., Kentucky Gem, Mettea, and Nereis. These are all American bred and show that American breeders are quite as skillful breeders as the Dutch. Mettea was awarded the first, and Betsse the second premium.

The same parties, reinforced by Yates & Son, brought nine little calves, several too young to name, but in the coming years will receive due attention. Suffice it to state that Stevens' Vinnie took the red ribbon, and a nameless young one belonging to Stillwell & Co., the blue.

The next breed to claim our attention is the old and well-established Ayrshire. There are only three herds on the grounds, and they are not in as good condition as last year. This breed is not generally diffused over our State, but are largely confined to our dairy belt, especially the cheese district. Only occasionally can the Ayrshire conformation be seen cropping out in our farm cattle.

In aged bull class, Mr. Fairweather, Pennsylvania, entered Premier; Mr. Henry Betts, Wellington, O., Blanch Burns' Lad, and Mr. F. E. Wright, Millersburg, O., Syndicate. Perhaps all of these animals were shown here last year, and were fully described in the report for 1884. Blanch Burns' Lad

ooks quite as well as then, but Premier takes the first, and Syndicate the second premium.

Only two two year-old bulls are entered, Mr. Fairweather's Clunie, and Mr. Betts' Jacob Henry. They have a strongly marked Ayrshire type, and doubtless have been carefully bred. Jacob Henry takes the first honors, Clunie the second.

A trio of yearlings are presented, Fairweather & Co.'s Lundie, Betts' Whit, and Wright's Lake. These are pretty specimens of the breed, Whit taking first, and Lake the second premium.

The same breeders enter a trio of calves, Wright's Troy leading his competitors, followed closely by Fairweather's Gairly.

The committee is now asked to name the best and her second, in a lot of nine aged cows, three of which are drafted from Fairweather & Co.'s herd, four from Mr. Betts' and three from Mr. Wright's. They all look like showing veterans, and do not fear the most critical comparison of udder, milk veins, or of any of the characteristics that distinguish deep milkers, with themselves or of any of the dairy breeds, but after much deliberation, Mr. Betts' Bright Eyes was given the red ribbon, and Mr. Wright's Nanette, the blue.

A quartette of two-year-old heifers, owned by the same gentlemen, were next examined. These heifers in nowise disparage their ancestors, or discount the skill of their breeders, but promise great future usefulness. Mr. Betts' Staly Lady was the first choice of the committee, Fairweather & Co.'s Carrie 2d, a close second.

Fairweather & Co., and Betts, each brought two yearlings into the show-ring, evidencing good breeding and judicious care. Fairweather & Co.'s Lucky Essex being the lucky first, and Betts' Carrie, the second choice.

Four little calves were then presented by the same parties, Mr. Betts' nameless youngster leading her competitors in the roll of honor, followed by Maid Tule, of Fairweather & Co.'s herd.

The Jersey breed of cattle has a well recognized place in our agricultural industry. As a producer of gilt-edged butter it is unrivalled, and no one desires to pluck one leaf from the laurels which it so justly claims. Its enormous capacity to consume and assimilate food has been illustrated satisfactorily, and its ability to convert a large per centum of food into butter, several notable cases demonstrate, but outside of this specialty, no claims are seriously made. In the course of time our abundant and nutritious grasses will give increased size, and our American bred Jersey will be in sharp contrast with those dwarfed by the scanty and innutritious herbage of its native sea-girt island.

In this ring of aged Jersey bulls, Messrs. Parsons & Black, Worthington, O., J. J. Maxon, Gallipolis, O., F. H. Johnson, South Bend, Ind., Isaac Reigel, Cedarville, O., I. B. VanHorn & Co., Columbus, O., and W. S. Mussleman, Bellefontaine, O., each show one bull but owing to the facts already stated, it is impossible to take any more than a bird's-eye view of them. They all show royalty of blood, and have only time to say they are, as a lot, first-class, and record that in the judgment of the committee, Johnson & Co.'s Duke of Willow Grove, is entitled to the first premium, and VanHorn & Co.'s Pierotte's Best Son, the second.

In the two-year-old class, Messrs. Parsons & Co., Johnson & Co., VanHorn & Co., Reigel, and Mrs. Hoover, Urbana, O., each owned one animal. This lot is hardly as good as the three-year-old, but passably good. Mrs. Hoover's Prince Victoria received the red, and Johnson & Co.'s Alexis Iron Bank, the blue.

With the exception of Mr. VanHorn, the same parties join with Mr. E. W. Pegg, Clintonville, O., and the Ohio State University, in making up the yearling bull class. There is nothing remarkable to note in this lot, but as breeders they are, perhaps, above the average. Mr. Pegg's Cedriclouis was awarded the first premium and Johnson & Co.'s Mareffie the second.

Mr. VanHorn takes the place of Mr. Pegg in forming the bull calf exhibit, otherwise the same herds are represented by one calf each. These are pretty kid-like little things, with the future before them, and a plenty of room to grow, doubtless they will meet the expectations of their skillful breeders. Mr. Reigel's nameless calf took the red, and Mrs. Hoover's the blue ribbon.

The aged Jersey cow class consisted of drafts from the following herds: Parsons & Co. contributed two, Johnson & Co. two, Ohio State University five, and Mrs. Hoover three. By intelligent crossing, in the veins of these cows, meet and commingle the sum of excellence of many of the great butter producers known to fame, and judging from the external appearances, they are no disparagement to their blue blood ancestry. But we cannot linger, the committee have proclaimed Johnson & Co.'s Little Patience the queen of the ring, and Ohio State University's Virgie Lyle, the first maid of honor.

Messrs. Parsons, Johnson, Hoover and VanHorn, each place a representative of their herd in the two-year-old class. These are a lot of promising young lassies, nearly allied to the lot just retired, by crosses of consanguinity, and there is no reason why their career will not be as brilliant. Mr. Van Horn's Bargene, was accorded the first premium, and Mrs. Hoover's Lister Cash, the second premium.

Messrs. Parsons, Johnson, Reigel, Hoover and Ohio State University, each contribute one heifer in the yearling class. These heifers show indications of careful breeding, and no doubt will accomplish all that is expected of them. Mrs. Hoover's Comask takes the first premium, and Parsons & Co.'s Luna May, the second premium.

All of the exhibitors join issue in the last class display. Some of the things are so young "their mamma's hardly know they are out." Parsons & Co. lead in three, Reigel two, while the Ohio State University, determined to capture the honors by force of numbers, send into the ring seven, making an exhibit of fourteen tiny calves. Well, they are pretty little creatures, but it required an expert to prognosticate their future outcome, although, if like begets like, they are likely to meet all reasonable expectations. Parsons' Pansie's Silvia, took first premium, and Reigel's little nameless youngster, the second.

The Devon breed is as old, so to speak, as the Devon hills, and are so distinctive in their characteristics that a description or introduction is unnecessary. It may not be out of place to say, that none of our domestic breeds of cattle are more uniform in their physical conformation and color, or prepotent as breeders. From some cause they have not been widely disseminated through this State.

Six splendid aged bulls were entered by Messrs. Payne, Parkman, O.; Pollock, Cedarville, O.; Wooley, Hilliard, O.; Whitmore, Casttown, O.; York, O., and Rumsey Bros., New York. These gentlemen are well known as first-class breeders in Devon circles, and these animals are not strangers to this show ring; therefore we will not try to describe their many excellent points, suffice it to say, they are worthy of the important position assigned them at the head of the herds. Mr. Payne's King William, however, is thought to possess the greatest number of points, and Mr. York's Bailey 2d, his next best.

Messrs. Whitmore, York, Pollock and Rumsey & Bro., furnish the showing with two-year-old bulls, each, one. They are, individually and collectively,

fully up to the average. Mr. York's Bruck Boy leads the quartette in the roll of honor, and Rumsey Bros.' Gen. Windham 2d, a close second.

Whitmore, York, and Pollock each put one in the yearling bull class. Whitmore's Bremen taking first premium, and Pollock's John Hardy, the second premium.

These are quickly followed by the bull calves, of which Mr. Wooley owns two, Whitmore, York, and Rumsey Bros., one each. They indicate good breeding, and may be heard from at future fairs. Wooley's Vashite won the red, and Whitmore's Bernadott wears the blue ribbon.

All of the Devon exhibitors send representatives into the aged cow ring. These eleven Devon matrons have proven themselves to be valuable factors in their respective herds, and fully represent the good qualities of their breed before a critical public. Mr. Payne's Bertha Payne receives the first badge of honor, and Mr. Whitmore's Pink Waterloo the blue ribbon.

Excepting Mr. Wooley, the same herds supply the two-year old class with competitors. This is a lot of handsome heifers just on the threshold of usefulness, and will not only be a source of pleasure, but of profit to their owners. Mr. Payne's Arod wins the first premium, and Whitmore's Gervase the second.

Whitmore, Payne, York, and Rumsey Bros., each send a yearling before the committee, a lot of nice young things. Sitter, of Mr. Payne's herd, takes the first premium, and Dinah, of Rumsey Bros., wins the second.

In the final contest, Payne and Pollock retire, but Wooley sends two calves to the ring, which, with two from York's herd, and one from Whitmore's and Rumsey Bros., make a fine display of infantile Devons. Mr. York's Mardi takes the first premium, and his Moss the second. Come again, Mr. York.

The Hereford is an ancient and noble breed of cattle. For more than a century they have contested every step of public favor with the Shorthorn. As a beef producer, he challenges the world to match him, and perhaps never in his history have his excellent qualities been held up before the public so prominently as during the last decade. In the western States he has many warm and influential admirers, but he has never made much headway in Ohio. There are a few herds of splendid specimens on the Reserve, but the white-faced badge is rarely seen elsewhere. Only three herds are on exhibition at this Fair, but they are good ones.

Mr. G. S. Cloyd, Ithica, O., and F. H. Johnson & Co., South Bend, Ind., each show a three-year old bull, that no Hereford breeder need be ashamed to claim as representatives of his favorite breed. Of the two, Mr. Cloyd's Hero was adjudged the best; Dakota, his competitor, wore the blue badge of honor.

Mr. G. W. Milliken, Youngstown, O., and Mr. Johnson, presented two most excellent two-year-old bulls; Milliken's Leotard took the first premium, Johnson's Century the second.

Mr. Milliken's Jim Blaine stood alone in the yearling class, consequently his election was a sure thing, and he deserved it.

The same breeders send to the ring each a bull calf that will look better after a while, but Mr. Milliken's Fair Boy is honored with the red ribbon, and Johnson's Frank H. takes the blue.

Mr. Cloyd joins the other two exhibitors and made a ring of four aged cows. These cows compare well in points of excellence with the aged bull class, and thus mated, ought to produce first-rate results. Mr. Johnson's Stately Maid gets the red ribbon, and his Dauntton Rose the blue.

Mr. Milliken's Jessamine and Easter 2d make up the two-year-old heifer class, and they are two good ones. The former takes the first and the latter the second.

Johnson and Milliken each show a yearling heifer. Spot 6th, of the first-named herd, wins the red, and Mabel of Mr. Milliken's, is her close second.

These gentlemen also show heifer calves, that will develop into splendid cows that will prove ornaments in their herds and monuments to their skill. Milliken's Lott received the red ribbon, Johnson's White Pigeon the blue.

The last breed that will be brought under review is the Shorthorn. Its characteristic excellence and adaptation to the use of the farmer is generally recognized, hence its wide dispersion over the whole country. Seventy per cent. of the 2,000,000 cattle in this State show a more or less visible admixture of Shorthorn. Our export cattle are nearly all Shorthorn grades, an importance, therefore, attaches to it as a factor in our commercial wealth commensurate to its value. Shorthorns have always been a leading attraction at this fair, and at no previous exhibition have they been more worthy of attention. Apropos, I may express my gratification upon noting the steady and marked improvement in the herds, that it has been my privilege to examine, at their annual gathering here, from their earliest calthood.

The three-year-old bull class was made by D. W. Browne, Tiffin, O., Tippecanoe; J. T. Miller, Columbus, O., Donald Duke; D. D. Richards, Newark, O., Young Rocket; N. S. Olin & Sons, Streetsboro, O., Duke of Lebanon; Jas. R. Anderson & Sons, Anderson, O., Enterprise; and C. C. Walker & Sons, Madison, O., Aclam Sharon 3d. The public is familiar with the majority of these animals, therefore they need no introduction. Tippecanoe is a very large bull, in fact, too large for usefulness. He weighs 2,500 pounds, and maintains a remarkable smoothness for his size. He is six years old, and has reached a mature development. Donald Duke is a good useful bull, four years old, and will work out good results in Mr. Miller's herd. Young Rocket, is a three-year-old, just reaching the full vigor of his bullhood, and Mr. Richards has the good judgment to show him in his working condition. By the way, Mr. Richards has made a vast improvement in his herd during the last six or eight years. Duke of Lebanon is a stranger here, is three years old, and has many good points. Enterprise is five years old, and sustains the reputation of his illustrious ancestors. Aclam Sharon is a three-year-old, combining the excellent qualities of the Airdries, Rose of Sharons, and Profitables. He was awarded the second premium, Enterprise the first, and Tippecanoe the third premium.

In the two-year-old class, Mr. Brown entered Col. Judy, a first-rate animal, although a little roughish in the shoulders, but shows his breastplate cross; Edwards & Sons, Youngstown, O., Airdrie of Pleasant Hill. His broken horn detracts somewhat from his appearance, but he is a worthy son of old Washington Airdrie, that is eulogy enough; Peter Boehm, Columbus, O., Hocking Valley 2d. He is thin, but proves that from the loins of Caroline, by Dashwood, excellence of a high order still flows; and J. M. Black, Hanover, O., 2d Phylis Lad. He is a good one, and bred on Mr. Black's excellent herd will afford him an opportunity to distinguish himself as a sire. Airdrie of Pleasant Hill took first premium; Hocking Valley 2d, the second premium; and Col. Judy, the third premium.

The yearling class had Edwards & Son's Airdrie of Pleasant Hill 8th; H. Renick's, Circleville, O., Darby Chief; Watson & Son's, South Charleston, O., Machern; G. H. Gorman's, Franklin, Mich., 3d Tea Rose Duke; D. D. Richards', Louan Mazurka; Olin & Son's, Matilda's Grand Duke; and J. M. Black's, Baron Wiley 4th. This is an exhibition of youngsters that is creditable to the skill of their breeders. Each has some points open to criticism, but their service will maintain the fair fame of their herd. Airdrie of Pleas-

ant Hill, was awarded first premium; Louan Mazurka, the second premium; and Matilda's Grand Duke, the third premium.

Mr. Amos Bowman, Somerset, O., and every Shorthorn breeder already named, is represented in the bull calf lot, making fifteen head. They range from good to first-class animals. The committee grade them thus, Anderson's little nameless calf, first; Edwards' Richmond, second, and Richard's Louan Airdrie Rocket, the third premium. The probabilities are that several of these calves will make honorable records in the future.

Ten grand Shorthorn cows stand before us. Menora, of Watson & Sons' herd, is a noble specimen of the Rosemary tribe; she is a little too lumpy, but nevertheless a fine cow. Mr. Boehm's Kitty, (a Caroline, by Dashwood), has just dropped a calf and is therefore somewhat out of shape. Mr. Brown's Nellie, is a red, of the Strawberry sort, a large roomy cow, with prominent hips; but is a little too thin for this show; his Tippecanoe, (a daisy), is a dark red, is thinish, but a good animal. Mr. Miller's Lass of Plainview, red and white, (Nannie Williams), is a large and useful cow. Mr. Walker's Profitable 16th, red, due to calf in December, is large, thick fleshed and a splendid type of the old Profitable tribe in every particular. Jennie May and Minnie Springdale, two better cows never adorned Mr. Anderson's herd. And Olin & Sons' Lady Florence, (Ruby), due to calf in November, and is said to give six gallons of milk at one milking, and Lady Ruth, (Ruby), roan, said to be quite as good at the pail as Lady Florence. Grouped as they now are, they make a picture that the lover of the beautiful in nature loves to gaze upon and contemplate. The committee have finally concluded that Profitable 16th must wear the insignia of highest honor, and Lady Florence the second, and Jennie May, the third. Without indulging in sloppy exaggeration, I do not believe three better cows ever graced the ring.

And the three-year-old class does not fall below in every excellence the one just passed out. Mr. Brown's Sally Bell, (Strawberry), is small only by comparison; Watson & Sons' Pixie 6h, has milked generously all summer, and is of a milking family, the Pixie; Walker's Profitable 27th, is heavy in calf, a chip off the old block, and will vie with her mother Profitable 16th, and Mr. Richards' Minnie's Gem, (Matilda), is in calf, pretty, but too thin for successful competition. Profitable 27th is accorded the red badge, Minnie's Gem the blue, and Sally Bell the white.

In the two year class were fourteen beautiful creatures of choice breeding, Edwards & Sons' Ella Moore 7th, (Matilda), and Princess Airdrie 3d, (Imp. Heart), are both spotted; P. Boehm's Lady Sharon (Rose of Sharon) and Magnolia Viola (Rose of Sharon), will do no violence to old Rose of Sharon's reputation; Watson & Sons' Olympia, (R. R. by Earnesty), has the longest hind quarters in the ring, and will grow into a very fine cow, and their Jessie 5th, (Rosemary), is also a good one; Mr. Walker's Mayflower, (Matilda), has some of her grand old ancestors excellence; Richards' Lulu 2d (Matilda), inherits many of the family's qualities, and his Minnie Sharon 2d (R. Sharon), is a good one; Olin & Sons' Miss Hathaway, (Rosemary,) is due to calf this September, and is extra good all over; and Anderson's Jennie Howell 2d, is hard to beat; Mr. Gorman's Lizzie 7th, does not detract from the lustre of her associates; Dr. Black's Julietta (Y. Phyllis) and 1st Gwynne of Hanover, are both good. But the Judges have pronounced Miss Hathaway the flower of the lot, and Princess Airdrie 3d her second best, and that Ella Moore 7th should wear the white ribbon.

The yearling class contained seven representatives, as follows; Morine, (Matilda), an extra good one, from Mr. Anderson's herd; Profitable, from Mr. Walker's, a true Profitable; Red Fancy 4th, (Caylps), very blocky and pretty

as a picture, fourteen months old, of Edwards' herd. Lizzie 8th and Rosa, (R. Sharon), of Mr. Gorman's herd, are too thin to show to any advantage; Oneida Lass, (Ruby), roan, soft as a peach, and extra good around heart, belongs to Olin & Son, and Belle of Walnut 7th, (Charlotte), a good useful heifer, is owned by Mr. Richards. Red Fancy 4th takes the red, Oneida Lass the blue, and Belle of Walnut 7th the white ribbon.

All the exhibitors send representatives into the calf class, they are generally good, and show their breeders to be thoughtful and skillful men. Mr. Walker's Red Rose, (Louan), took first premium, and his Profitable 2d, was the second, and Mr. Brown's Tulip, (Daisy), received the white ribbon.

I was called home Thursday evening by sickness, consequently I was denied the opportunity to enjoy the grandest pageantry of the Fair. My friend, R. Baker, kindly offered to report the herd exhibit for me, but he was called to other duties and delegated Mr. Smith, of Elyria, to act for him, but somehow or other Mr. Smith's notes were mislaid, or the report would have been in its proper place.

In the grand herd sweepstakes for beef breeds, the herds of Messrs. Brown, Edwards & Sons, F. H. Johnson & Co., J. T. Miller, Walker & Sons, D. D. Richards and J. R. Anderson, all Shorthorns except Johnson's Holstein herd. Each comprised the very best animals in their respective herds, and no breeder need feel very badly to be beaten by Anderson's champion sweepstake herd. Only two entries of three cows with calves were made, Brown and Walker. Walker's Profitables taking the seventy-five dollar prize. The competitors for the fifty dollars were: Hero, Hereford; Airdrie of Pleasant Hill, Shorthorn; Dakota, Holstein; Aclam Sharon 3d, Shorthorn; Young Rocket, Shorthorn; Enterprise, Shorthorn; and H. Renick's bull, Shorthorn. Edwards & Sons' Airdrie of Pleasant Hill, received the distinguished honor of being judged the best bull in the show.

The sweepstake for the best cow of any age or breed contained Ella Moore 7th; Dauntion Red Rose, Holstein; Lass of Plainview; Profitable 16th and 21st; Jennie May, and Lady Florence. This is a very strong ring. Mr. Walker's Profitable 16th, wins the laurels, of which he has just cause to be proud. Breeding Bulls, with five of their calves, had but four competitors, all Shorthorns. Mr. Walker's Aclam Sharon winning the seventy five dollar prize, and the proud distinction of being adjudged a superior sire.

Sweepstakes on the Dairy breeds brought to the front Fairweather's herd of Ayrshires; Betts' Ayrshires; Stevens' Holsteins; Rumsey Bros.' Devons; Wright's Ayrshires; Yates & Son's Holsteins; Henderson's Holsteins; and Stillwell & Co.'s Holsteins. This is certainly a strong array of milking cattle, and the \$100 prize gives Mr. Stevens' herd a proud pre-eminence. Mr. Stevens is also adjudged to own the best three cows and calves.

Sweepstake on bulls of any age or class, brought together eleven of the best on the grounds, all Holsteins, except one Ayrshire and one Devon. French & Bros., International Prince (Holstein) takes the \$50.

Fifty dollars for the best cow of any age or class, brings out five Holsteins and one Ayrshire, Mr. Stevens' Rhoda, being the lucky one.

Mr. Stevens' Constantyn, takes the \$75 over his two competitors, as the best bull and five of his get.

Sweepstakes on butter breeds, brought in competition a select draft from Parsons & Co.'s and Mrs. Hoover's Jersey herds, and Stillwell & Co.'s and Johnson & Co.'s Holstein herds. Johnson's herd taking the \$100 after a hot contest. The best three cows and their calves belonging to Mrs. Hoover, Urbana, O. Johnson's Duke of Willow Grove, took the \$50 prize, as the best bull of

any age, in a class of three Jerseys and one Holstein. His Little Patience also won the \$50 premium, over her distinguished competitors.

The \$75 prize for the best bull with three of his get, was given to Mr. Van Horne's Stokepogis Prince.

For further particulars, regarding herd premiums, see Bulletin of Thirty-Sixth Ohio State Fair.

Respectfully submitted,

J. S. R. HAZZARD.

FIRST ANNUAL REPORT

OF THE

OHIO LIVE STOCK COMMISSION.

To His Excellency, George Hoadly, Governor of Ohio :

In accordance with the provisions of the statute, we have the honor to submit the First Annual Report of the Board of Live Stock Commissioners.

At the date of our organization, in May last, it was found that a good deal of uneasiness existed among farmers of stock breeding districts, on account of the action taken in other States, looking to the exclusion of Ohio cattle from their borders. occasioned by the outbreak of contagious *flexuro-pneumonia*, in two herd of Jersey cattle in the counties of Miami and Montgomery. This alarming contagion was brought to these localities from either New York or Maryland, in the autumn or winter of 1883-4. Cattle being imported from both those States, by Mr. C. R. C. Dye, of Troy, in whose herd the disease first appeared.

Although this outbreak appeared in the month of February, 1884, its true character was not known to the public until September of that year, at which time, one of our number, having received intelligence in regard to the matter, at once applied to the President of the State Board of Agriculture, and to the Chief of the Bureau of Animal Industry at Washington, to adopt such measures as were practicable under the defective and inadequate legislation of Congress, and the absence of all State legislation on the subject, to prevent the spread of the dread contagion.

Col. Foster, then President of the State Board of Agriculture, proceeded at once to the locality, and learned from the attending veterinarian that the malady was, indeed, the contagious lung plague, and therefore ordered that cattle on a farm in the neighborhood, already entered for exhibition at the State Fair, to be held the following week, should not be permitted to enter the grounds. A day or two later Dr. Salmon, Chief of the Bureau of Animal Industry, appeared and arranged with the owner of the herd for the strict quarantine of the infected premises, and isolation of suspected animals, and finally slaughtered seven cattle that were affected with the disease in a chronic form, three having been previously slaughtered by Dr. J. S. Butler, the Veterinary Surgeon of Piqua, that had been called to treat them. Besides these, three had died of the disease.

As soon as the nature of the disease had been made known to the proprietor by Dr. Butler, he claims that all sales were stopped, the sick animals isolated, and the premises disinfected, and that the malady did not spread to other herds. But unfortunately a sale had been made to Mr. Mitchell, near Dayton, and another to Mr. Epler, of Virginia, in the State of Illinois.

Though the disease broke out in Mr. Mitchell's herd, causing the loss, by death, of seven animals, and two subsequently slaughtered, the contagion, on

account of the prudent management of Mr. Mitchell, was not communicated to any other herd. But there was a wide dissemination of the malady from the Epler herd, to different points in Illinois and to one locality in Kentucky. Mr. Epler having held a public sale on the 21st of February, from which cattle were taken to these various localities, either directly, or from herds of parties purchasing at this sale.

On account of the alarm occasioned by these various out breaks, most of the Western States and Territories had adopted such restriction and prohibitory regulations against the importation of cattle from Ohio, that our breeders and other parties desiring to ship stock to the West, at the date of the organization of this Commission, found themselves excluded from these markets, because in the absence of all legislation on the subject, they could obtain no certificates of health, etc., as required by these prohibitory regulations. There was no authority for the employment of a State Veterinarian as provided in most of the State regulations, to examine stock and give certificates of health, or the adoption of measures to protect the live stock interests of the State from loss by the importation and dissemination of contagious diseases.

At the first meeting of the commissioners, thereafter, the service of a competent Veterinary Surgeon, Dr. J. S. Butler, of Piqua, were secured, and proper rules adopted for the examination of stock, the issuing of certificates of health, etc., which served to lessen very materially the inconveniences and losses, resulting from these restrictions upon our cattle trade.

Our next duty was to make thorough examination of the two herds before mentioned, in which *pleuro pneumonia* had appeared; and after satisfying ourselves that the contagion had not spread to other herds, to adopt such measures as were necessary to prevent the possibility of suspected animals coming in contact with other cattle until all danger was passed. There was at this time, May 13, in Mr. Dyes' herd no animals on which any evidence of the dread contagion, acute or chronic, could be detected.

Mr. Mitchell's cattle, too, appeared in good condition, and there has been no acute lung trouble in the herd, since the month of June, 1884. However, to remove all doubt, Mr. Mitchell afterwards consented to the slaughter of two recovered cases, the Commission agreeing that a recommendation should be made to the Legislature by the Governor to provide reasonable compensation. And we respectfully request the Governor to recommend that authority be conferred upon the Live Stock Commission to make such compensation for this appropriation of property for public use, as they, under all the circumstances, may deem just and proper.

There have been several false reports of fresh out-breaks of this fatal lung plague, which the commissioners, after immediate and thorough examination, promptly contradicted, not, however, until, in some instances, serious loss was occasioned.

We are now able to assure the cattle growing interests of the State that no case of this contagious malady exists within our borders; and that we have been able to give such assurance to the authorities of other States in which restrictions have been imposed against the importation of our cattle that they have all been removed, with the single exception of the unreasonable and harsh prohibitory regulations maintained in the State of Nebraska.*

Besides giving attention to this cattle plague, as being the most alarming of the contagious diseases that have invaded our herds and flocks, the Commission has had to deal with several cases of glanders among horses, appearing in different parts of the State. In some of these cases we have obtained the consent of the owners to destroy the diseased animals, while in others we could

*In Nebraska, too, the restriction has now been removed.

only order them kept in strict quarantine, under the supervision of persons designated by the Board.

We have also been notified of out-breaks of hog cholera, which has prevailed in some sections of the State, occasioning very serious loss. But in answer to the appeals that have been made to us by farmers whose herds have been invaded by this alarming swine plague, we have been obliged to say that the law furnished neither the means nor the authority to relieve them.

The Commission has visited some of the most important live stock shipping points in the State, for the purpose of inspecting the sanitary condition of the yards and buildings, and also to inquire what precautionary measures were observed to prevent the transportation of contagion from infected districts, by the inspection of suspected animals, the cleaning and disinfecting of cars, etc. Some of the stock yards we found in good condition, while others were unclean and filthy. At the Union Stock Yards at Cincinnati, we found nothing to criticise, as respects their sanitary condition. But here, as at the yards of the Kentucky Central R. R. in Covington, and all other shipping points, we learned that no precautionary means were employed to prevent the transportation of diseased stock, or such as has been exposed to disease in infected districts. Nor did we find that attention had been given to the sanitary condition of the cars in which live stock was carried. The stock cars were only cleared of filthy bedding and dung, when the accumulations interfered with loading them. So far as we were able to learn disinfection of these cars is not attended to, even in cases where they are known to have been used in transporting stock from districts in which contagious diseases prevail.

Freight agents and superintendents of the stock yards with whom we conversed on the subject, expressed a willingness, and in most instances a desire, to comply with any reasonable regulations on this subject, provided they were made generally obligatory and operative, and we found the opinion that these regulations to be efficient must be prescribed by National authority, to be generally entertained by these practical men.

If the Bureau of Animal Industry is not invested with authority under existing law to establish these regulations, the public must demand its amendment; because, by these simple and reasonable protective measures, the dissemination of such contagious diseases as *pleuro-pneumonia* and Texas Fever among cattle, glanders among horses, foot-rot in sheep and hog cholera would be largely diminished, and because such regulations are absolutely essential to the final extirpation of these diseases.

In view of the enormous losses occasioned by the prevalence of the hog cholera whose ravages during the year, we are told, will cost the farmers of America no less than *twenty five or thirty million of dollars*, and of the appalling danger of future out-breaks of the dread contagious lung plague in cattle, with which we are threatened by importation from infected districts in other States, together with the increase of glanders among our horses—the powers conferred and the means appropriated by the act of last April, appear so utterly inadequate, that we wonder how the Legislature expected the Commission was to proceed to execute its commands, to wit: “to prevent the spread of dangerous and fatal disease among domestic animals, and provide for the extirpation of such diseases.”

Compared with the legislation of other stock-growing States, this defective statute, with its grossly, meagre appropriation, appears, in most unfavorable, not to say humiliating contrast.

In most of the States provision is made for the slaughter of cattle affected with the contagious lung plague, and the compensation of the owners for the loss sustained, and in others, authority is also given to destroy horses affected

with glanders; while in all the States that have legislated upon this subject, liberal appropriations are made to defray the expenses of the Sanitary Boards, including investigations by veterinarians and other competent persons acting with their authority, as well as to meet the appraisements of animals slaughtered to prevent the spread of disease.

The statute under which this commission was created was hurried through the two houses near the close of the last session of the General Assembly, and for want of time for its proper consideration, the Agricultural Committee of the House of Representatives, from which the bill was reported, was obliged to consent to the emasculation of its most important provisions, to save the measure from threatened defeat.

It is therefore most respectfully suggested that the Governor recommend such amendments to this statute as will authorize the slaughter of cattle that are affected with, or have been exposed to, the disease known as contagious *pleuro pneumonia*, with such compensation for the loss occasioned by the slaughter, as may be just and equitable. Authority should also be given to destroy glandered horses. But as this disease is, by the general judgment of the veterinary profession held to be incurable, it would seem that no just claim could be made against the State for animals killed to prevent the spread of the malady. As the period of incubation is short, horses that may have been exposed to infection can be isolated until danger is passed with but little expense. It should be made a penal offense to offer glandered horses for sale, or to expose them in public places or where other animals may come in contact with them.

In the absence of proper legislation on the subject by Congress, it is also respectfully suggested that the Governor recommend an amendment to the existing law, authorizing him, upon the report made by the Live Stock Commissioners, of the existence of the disease of *pleuro-pneumonia* among cattle in any localities outside of the State, to schedule such localities by proclamation, setting for that importations of cattle from such infected localities into this State will be subjected to such regulations as may be prescribed by said Board of Live Stock Commissioners, and approved by the Governor.

To carry on this most important work, we respectfully ask the following appropriations:

For expenses of the Commissioners, including compensation for veterinary and other services, employed throughout the year, the sum of.....	\$3,000 00
To compensate owner of cattle slaughtered by order of the Commission, to be drawn only in case of another out-break of contagious <i>pleuro-pneumonia</i> , the sum of.....	10,000 00
For expenses of experiments to prevent the spread of hog cholera, by the destruction of diseased swine, disinfection and such other means as may be deemed practicable and expedient, and the collection of statistics, and the results of experiments and investigations, the sum of.....	5,000 00

These several sums amount to only eighteen thousand dollars, while the sums appropriated by the State of Illinois to the Sanitary Live Stock Commission aggregate no less than *sixty thousand dollars* for the current year.

All of which is respectfully submitted,

B. W. CARLISLE,
T. P. SHIELDS,
T. C. JONES,
Live Stock Commissioners.

REPORT UPON THE SHEEP EXHIBIT.

BY J. F. HICKMAN.

The undersigned, being appointed as reporter in the sheep department at the thirty-sixth annual fair, attended with the several committees during their examinations and in making their awards, and has gathered notes from which he deduces the following report. But before entering into full details I desire to say that if in this report an error does occur be it understood that it was or is unintentional.

Probably no one thing has done so much to advance the interests of sheep-breeding and wool-growing as our State Fair. Competition in the show ring cannot but be a means to stimulate every breeder competing, as well as outsiders to greater exertion and closer examination into the individual points which make up an animal of superior excellence, both in beauty of appearance, and beauty as viewed from a practical standpoint. To combine the many desirable points, and to satisfy the mind's ideal is a task of no small proportion, yet when we entered the sheep pens on Tuesday morning at ten o'clock, and the first exhibit was called by the member in charge, Mr. Pow, we were lead to think that perfection in breeding had been attained. The first exhibit was of the middle wool class of sheep, including Oxforddowns, Hampshiredowns, and Shropshiredowns. The first competition in this class being on rams, two years and over, and in it there were four entries, on which the first award was made to F. S. Butler, of Ridgway, Ohio, and the second to J. F. Rundel, of Birmingham, Michigan.

In the next entry of rams under two years old there were four presented for competition, and the first premium was awarded to J. F. Rundel, of Birmingham, Michigan, and the second premium to Thos. B. Bennington, of LaPorte, Ohio.

Next came ram lambs, in which there were six exhibited. In this class "Fortune," owned by J. F. Rundel, received first premium, and "Safeguard," owned by Thos. B. Bennington, took second.

Three ewes, over two years old, came next in order. This was a very fine exhibit, and gave the committee some careful thinking to do, but after due deliberation the first premium was awarded to the trio of E. S. Butler, of Ridgway, Ohio, and the second to Thos. B. Bennington, of LaPorte, Ohio.

Next was a pen of three ewes, under two years old. The nine head exhibited in this class were perfect models of neatness, having the appearance of having been moulded and not grown as bone and sinew. The first award was given to J. F. Rundel, Birmingham, Michigan, and the second to E. S. Butler, of Ridgway, Ohio. These were followed by an exhibit of ewe lambs, in which there were five entries. But Mr. Rundel, of Birmingham, Michigan, having two entries in this lot succeeded in securing both the first and second premiums.

This closed the awards on the "downs," including Oxford, Hampshire and Shropshiredowns of Entry Book 30.

Promptly at 1:30 p. m. the same committee reported, and entry book 31 was taken out and the examination of the Southdowns commenced.

Rams two years old and over were called first, in which there were three entries. The first award was given to W. D. and L. C. Anderson, of Anderson, Ohio, and the second to Thos. B. Bennington, of LaPorte, Ohio.

Rams under two years old came next, of which there were five entries. Each ram in this show gave evidence of possessing the points of typical mutton sheep, and for quite a while the committee were evidently puzzled to know which of the five was most worthy of the first award, but finally settled upon "Ohio Standard," a sheep owned by W. D. and L. C. Anderson, of Anderson, Ohio, and the second premium was awarded to the same firm. Neither award, however, was unanimous, which is a proof of the close competition in this class. Ram lambs, of which there were four entries, both first and second premiums were won by W. D. and L. C. Anderson, of Anderson, Ohio.

Next was the ewes over two years old; but two entries. The first premium was given to W. D. and L. C. Anderson, and the second to J. C. Leffel, of New Carlisle, Ohio. Then came pen of three ewes, under two years, in which there were but two entries. Both entries were good, and gave evidence of superior care and attention. After some hesitation the first award went to W. D. and L. C. Anderson, and the second to J. C. Leffel, of New Carlisle, Ohio. And in the next entry in order of three yew lambs there were three entries. J. F. Rundel received first premium, and W. D. and L. C. Anderson received second. This was also a remarkably good show. The committee finished this work at about three p. m., and were then continued on Entry Book 32, Fat Sheep. Beginning with pen of three fat weathers, two years and under three, of which there were three entries. The first premium was awarded to B. Waddle, of Marion, Ohio, and the second to G. D. Postle, of Alton, Ohio. Pen of three fat weathers, over one year and under two; three entries. Mr. Waddle again took first premium, and the second was fairly won by J. F. Rundel, of Birmingham, Michigan.

Pen of three lamb wethers. There were two exhibitors in this class, and as to size and quality of lambs, aside from fatness, there was no question. But the committee was of the opinion that both exhibits lacked the one desirable and most essential quality, that of fatness; hence no award was made, neither first nor second.

Next came single fat wether of any age, in which class there were three entries, all very fine sheep, indeed. W. D. and L. C. Anderson received first premium, and second premium to B. Waddle, of Marion, Ohio. This concluded the work of the committee for Tuesday, and they were excused after having signed the several entry books upon which they had passed.

MERINOS.

On Wednesday morning the committee to pass upon the Merino sheep were late in coming together, and consequently did not begin their work until about 10:30. Previous to their beginning the member in charge, Mr. Pow, by request of some of the exhibitors, read the following extract from the rules, viz.: "Sheep that have been improperly or stubble shorn, or that have been blackened, or have had any other extraneous substance applied, shall be excluded from competition." It may not be out of place to remark just here, that there seems to be a growing demand for more honest shearing, and therefore more honest showing. We were glad to see, in one instance, that when a committee could not agree, they all left their first choice and gave the premium to that flock which was most honestly shorn or exhibited, and publicly gave that reason for changing. That was a move in the right direction, not that honesty deserves to be rewarded, but because dishonesty should be punished.

All things being in readiness, rams three years old and over were brought into the arena, and the committee proceeded to perform their duty, and they went into the work as if they were truly judges, and we believe that as such they proved themselves true to the trust. The first award was given to Willis

and Staley, of Lewis Center and Maysville, Ohio, the second award to D. W. Thomas, third to Cook and Morse, of Raymonds, Ohio. The above was ram with two of his get.

Next came ram two years old and under three. There were seven entries. This was a very fair show, in which D. Pugh and Sons, of Fairview, W. Va., carried off the first premium. M. P. Ashbrook, of Granville, Ohio, took second, and Allen McDonald, of Hookstown, Pa., third.

Ram one year old and under two, seven exhibitors. First award to Willis and Staley, second to the same firm, and the third to Allan McDonald.

Next was ram lamb, in which class there were nine entries. First award went to Willis and Staley, second to S. W. Thomas, and the third to Allan McDonald.

Next in order was pen of three ewes three years old and over. The exhibitors numbered seven, and the first premium was awarded to Willis and Staley, second to Allan McDonald, and the third to Cook and Moore.

The hour having arrived for the meeting of the State Wool growers' Association, the member in charge, Mr. Pow, announced that the committee would suspend operations for one hour to give all a chance to attend the meeting in Grange Hall on the Fair grounds.

Promptly at three P. M. the committee resumed their work, beginning with pen of three ewes, two years and under three. There were three entries of three each, which gave the committee a very laborious job to examine and carefully handle the entire thirty head. The first premium was awarded to S. W. Thomas and Co., the second to Willis and Staley, and the third to Allan McDonald.

Pen of three ewes under two years old came next in order. There was a very fine show, there being twenty-seven head on exhibition, or nine exhibitors. The first premium went to Allan McDonald, of Hookstown, Pa., the second to S. W. Thomas & Co., the third to D. Pugh and Sons.

This was followed by pen of three ewe lambs, in which class there were six entries. Here were eighteen ewe lambs, each bearing a splendid fleece and fine forms, both demanding the admiration of the numerous visitors in the department at the time, as well as attracting the eye of men well versed in the main points of well bred sheep. This exhibit seemed to almost bewilder the committee, but after careful examination, and manifest anxiety to do justice in their decision, they awarded the first premium to Allan McDonald, of Hookstown, Pa., the second to D. Pugh and Sons, of Fairview, W. Va., and the third to Cook and Morse of Raymond, Ohio.

This finished the work of the committee on this class, and they signed the entry book and dispersed for the day.

Wednesday afternoon, at three o'clock the committee on Black-top Merinos began their work by the Superintendent of the department, Mr. Brashears, calling into the show ring rams two years old and over. There were six entries and the rams were of good quality, both as to carcass and fleece, showing that with careful and intelligent breeding they are capable of a development which to some would be surprising. The committee found that they had no small task to perform in order to pass upon this class of sheep. In due season they decided to give in this class the first premium to J. G. Paxton and Sons, Houstonville, Pa., and the second to T. M. Paxton, of McConnell's Mills, Pa.

Next came ram under two years old, of which there five entries. The red ribbon fell to J. G. Paxton, of Houstonville, Pa., and the blue to Alvin Craig, of Cadiz, Ohio, the last sheep, called "Thurman."

Next came the ram lambs. Of these there were but four, but what was lacking in quantity was well supplied in quality, and the red ribbon was very justly

given to T. M. Paxton, of McConnell's Mills, Pa., and the second to James Mills, of Updegraff, Ohio.

Fifteen ewes over two years are now challenging the admiration of all good judges of sheep. After a thorough examination the committee placed their first award upon the trio owned by James Mills, of Updegraff, Ohio, and the second to T. M. Paxton, of Houstonville, Pa.

Next came pen of three ewes under two years old. There was the same number in the exhibit as was in the preceding, and the red ribbon was given to James M. Quincy, of Houstonville, Pa., and the blue to J. G. Paxton, of the same place.

Following this was the last of the Black-top exhibits, viz.: Pen of three ewe lambs. There were four entries, and all were what might be termed prime animals. The committee placed the first award upon the trio belonging to T. M. Paxton, of McConnell's Mill, Pa., and the second to J. G. Paxton, of Houstonville, Pa.

The same committee were continued for sweepstakes on Black-top Merinos. This consisted of one ram, three ewes over one year old, and three ewe lambs, to be bred and owned exclusively by the exhibitor. Luster, length and density to be specially considered. After being in something of a quandary for a time the committee rested the case of sweepstakes with T. M. Paxton, of McConnell's Mills, Pa.

LONG WOOLS.

The Long Wools, although existing under several different local names, they are now chiefly designated under those of Leceister, Cotswold and Lincolns. Although bred in England, from time immemorial, they are far from being our oldest species, for their development in American husbandry has been within the last half century, in fact but few, until quite recently, have been imported from England direct, most of them having come by the way of Canada. They are among the best of mutton breeds, growing larger than any other breeds that we have. They take on flesh readily, with good keeping. In their original condition, they were coarse, rangy and leggy, yet always yielding large fleeces. Upward of a hundred years ago, the celebrated English stock-breeder, Bakewell, took one of these varieties, the Leceister, in hand for improvement. He found them deficient in form, slow feeders, and late in maturity. He began by selecting the choicest animals of the race, and by good feeding and management throughout, he soon brought them up to a character differing widely from the original race, and the results of his labors are undoubtedly stamped upon the long wool flocks of the present. Other breeders were not slow to follow in Bakewell's footsteps, and used the same plans in developing the Cotswolds and Lincolns. Hence, to-day, we have before us a fine display of this group of sheep. The Lincolns and Cotswolds giving some indications of being more hardy than the Leceisters. But let us not ramble too far from our subject, for already Entry Book 29 has been introduced, and five rams over two years old are the subjects of an intelligent appearing committee, who have awarded the first prize to Artz Bros., of Osborne, Ohio, and the second to D. M. Beard, of Anderson, Ohio.

Next came rams under two years old, of which there are four entries. But the first premium is announced to Artz Bros., and the second to D. M. Beard. This is followed by ram lambs, of which there is but one, entered by Artz Bros. The judges decide that it is worthy of the first premium, and so recommend that the first be awarded.

Pen of three ewes, over two years old, came next. There was but a single entry in this class, but the three ewes presented were very fine, and well worthy of a first premium, which they were awarded without hesitation.

Now we have before us two entries of three ewes under two years old. The first award goes to Artz Bros., of Osborne, Ohio, and the second to D. M. Beard, of Anderson, Ohio.

Next came pen of three ewe lambs, of which there were but two entries, and while the lambs were fine in both cases, yet the committee soon decided that the red ribbon was due to Artz Bros., and the blue to D. M. Beard.

In sweepstakes on fine woolled sheep, Book 33, the quality, density, length, quantity and evenness of wool, and the perfection of form and size to be specially considered. The time for these awards was set for two p. m. on September 3d, but the committee failed to put in an appearance, and Mr. Pow was exercised considerably to secure a competent committee, but finally succeeded, and the committee went to work about three o'clock with six entries of best ram of any age, with five of his get, making in all thirty-six head, to be examined and compared, but time and patience was all that was required, and with eager minds and steady hands the work was accomplished, and the sweepstakes awarded to Willis and Staley, Lewis Center, Ohio.

Next came best flock of Merinos, one ram and three ewes over two years old, three ewes under two, and three ewe lambs, to be bred and owned exclusively by the exhibitor. Here are three entries, and it is no exaggeration to say that the thirty head here in competition would be a little fortune in the hands of an intelligent breeder. Many visitors were heard to say, "What a fine show that is," and we have reason to believe that the assertion was more replete with truth than with poetry. The sweepstakes was finally placed with the flock of J. W. Pollock, of Cedarville, Ohio.

This ended sweepstakes on fine wool, and the committee continued for the purposes of examining and passing upon the fleeces of wool. The fleeces to be exhibited by growers, condition, as well as quality, to be considered. First was best five fleeces of fine wool. In this class, there were but two entries; first premium only; no second awards. The first premium was awarded to James Mills, of Updegraff, Ohio. There was apparently a very wide difference in the two exhibits. The fleeces of B. Waddel giving evidence of greater care in preparation, but the evenness in length of staple in the fleeces of Mr. Mills gave his wool the preference in the views of the committee. There was no competition in the next two classes. Five fleeces of long wool, and five fleeces of medium wool, both exhibited by B. Waddel, were awarded first premium. Taking into consideration the great number of sheep grown, and the vast amount of wool produced in the State of Ohio, it is certainly a surprising thing that there is so little competition in fleece wool at our State Fair. The cost of transportation is small, and when once there it costs nothing to keep it during the Fair, besides it cannot be considered a perishable article. For these reasons, fleece wool has the advantage over many articles that are exhibited; and hence why should the exhibit remain so meagre, and the interest in this product so limited? We know not the reason, but leave the question to be answered by the wool growers of our State.

The committee having finished the examination of fleeces, have now accomplished their work and are discharged, which closes the work of Thursday.

Friday morning the committee on Sweepstakes for long wool reported promptly at nine o'clock, and commenced their work on best ram of any age, with three of his get. There were but two entries in this class, hence the work was short, which ended in placing the award to the flock of Artz Bros., of Osborne, Ohio.

Next in the show circle was best ewe, with two of her lambs. Again there were but two entries, and sweepstakes was received by Artz Bros. Following this was best flock, to consist of one ram and five ewes, in which contest Artz Bros. again carried off sweepstakes.

Entry Book 35 was now brought out, and the Superintendent called for Sweepstakes on Southdowns. This consisted of best flock of one ram and five ewes, and there was but two entries. In this contest it is presumable that the mutton qualities were of the first and most vital importance, not merely in the subjects themselves, but as to their chances of reproduction. The award of sweepstakes fell to W. D. & S. C. Anderson, of Anderson, Ohio.

Now came Entry Book 36. Sweepstakes on Oxforddowns, Hampshiredowns, and Shropshiredowns. This consisted of best flock of one ram and five ewes, of either of the above downs. This was also to be the last show of the season in the sheep department. We have three entries before us. After a very critical examination of these three lots of well kept sheep the committee felt constrained to give the sweepstakes to E. S. Butler, of Ridgway, Ohio. This ended the labors of the regular committee. It had given diligent attention to the proper discharge of the duties imposed upon it, and was quite satisfied in being relieved from further service. The committee was therefore duly discharged. This concluded the labors of the several committees in the sheep department.

I must be permitted to say, that the several committees were composed of gentlemen who were competent, careful, and discriminating in all their decisions. The motive of justice to all seemed, and was the prevailing sentiment and the objective point. And when the work was ended exhibitors seemed well satisfied, and during the entire exhibition we heard no jarring or question raised as to an improper or misplaced award. The only point at which any question was raised was where the committee refused to make any award at all upon fat lambs, but the committee acted upon their convictions, and stuck to their decision, for which they deserve credit. In justice to the members of that committee, we may further say that different men, who ought to be good judges of fat sheep, agreed with them in their decision.

There were 412 head of sheep on exhibition, 212 of which were Merinos. Nearly one-half of the balance were Shropshiredowns. This class of sheep seem to be on the increase in the United States, for we discover that the exhibit of Shropshires at our State Fair are double what they were five years ago. They partake, largely, of the same nature and disposition as the Southdowns. They are nearly one-third larger than the Southdown, although descended from the same original race. In quality and appearance they much resemble the Southdowns, but whether for wool and mutton purposes they are really superior other than in weight of carcass and fleece it yet a question? They are certainly a coarser sheep, and will never be brought to the same degree of fitness in flavor and quality as that which characterizes the Southdown.

GENERAL REMARKS.

We may be permitted to add before closing this report, that the general outlook for sheep-husbandry is no more encouraging than it was a year ago, yet our breeders and wool producers seem to bear it and hope for better things. Yet we have but little to base our hopes upon, when we recall the fact that our wool clip of 1884 brought us from 30 to 35 cents, while in 1885 it brought from 27 to 31 cents. At the present it is true that there is some better demand for wool with a slight increase in price, but when we calculate the vast falling off in numbers of sheep, as well as the reduced increase and the low price of fat sheep, we will still be led to wonder and query again. Whether or no sheep-raising will actually pay or not, the fact is there is no question about it we are losing money every day that we continue in the sheep business. Our only hope is in the future, and upon that we must build; and yet it is our opinion that with the present Congress we cannot expect to accomplish anything. All will agree

that we must have protection from foreign wools, or else we must sacrifice this wool growing industry in these United States, and this we cannot afford to do. If our wools were inferior to foreign wools, then we should have some reason for stepping down and out of the business; but such is not the case, for it has been proven that the United States, yes the State of Ohio, has produced as fine wools as can be produce in any country on the globe; and what she has done she can do again in that regard, if remuneration is forthcoming for so doing.

In closing this report, I ask that the faults and defects, if not too great, may be generously overlooked.

All of which is most respectfull submitted.

REPORT ON THE SWINE EXHIBIT.

BY JOSEPH ALLEN.

To the Ohio State Board of Agriculture :

Having been appointed by the State Board of Agriculture as your reporter for the Swine Department of the Ohio State Fair, held at Columbus from August 31 to September 4, 1885, I would most respectfully submit the following report:

I am fully aware of the responsible position you have assigned me, and in entering upon the discharge of the duty involved in this branch of the exhibition, I hesitate to commence the task, as every intelligent agriculturist knows that the moneyed interest involved in the raising of swine in the United States will compare favorably with other branches of live stock. Last year (1884) the number of swine in the United States, reported by State auditors, gives the total number 44,200,893 head. This number does not include the millions that came into existence after the spring enumeration, and are disposed of before the next spring, and they are not enumerated.

The first swine brought to this country was in 1538. They were a coarse-bone, long-legged, and unsightly animal; and as late as my boyhood many of the breeds were coarse-bone, roached-back, with large flapping ears, coarse hair and bristles standing erect nearly the entire length of their backs, and they produced rather a coarse grain meat; but there has been as great improvement in the breed of swine as in any other kind of stock.

The Berkshire was introduced into Ohio about the year 1835. Since that time they have undergone marked changes by careful selection and breeding. In 1841 the Cincinnati pork packers discarded them; they were thin in their flanks, and only the largest sized hogs that would make clear pork—and this brand was in demand at that time; but now the great bulk of the hogs are made into bulk meats, such as breakfast bacon and bulk sides, and but a very small amount into barrel meat (mess pork).

Now, the most desirable class of hogs to fill the market is a medium size, compact hog, with good sides and hams, light shoulders and small heads, as shoulders are the lowest priced meat in the hog, and since this change is the mode of packing, the improved Berkshire are one among our choice breeds for general purpose, and they now rank with the Poland-China and Chester Whites as one among the most profitable breeds for the farmer, as these breeds, Berkshires, Poland-Chinas, and Chester Whites, combine the essential qualities to command the highest price, and they give in return for labor, capital employed, and for food consumed the largest per cent. of high priced meat (with other breeds may pay fair profits), and they are remarkable for fine style, perfect symmetry in form, for superior muscular development, vigor, and activity, rapid growth, large size, early maturity, vigor of constitution, fatten at any age and the quality of their meat cannot be excelled, if equaled, by any other breed of swine.

The pork trade is now one of the leading industries of the country. The year 1833 Cincinnati was the great commercial pork packing point in the West, and that year packed 85,000 head of hogs, and last winter (1884) there was packed in one day 150,000 head, and for the past year in the West 10,000,000 hogs were packed and 4,000,000 heads shipped to Eastern markets. Should we add to this number those slaughtered by local butchers for home retail trade,

and the number killed by farmers for home consumption, it would swell the annual number of swine to supply demand to almost an incredible number.

Our State and county fairs should be so managed as to be the school room to educate the agricultural class of our State in the advancement of the farming interests, and another of the important missions is to gather together the various products of the farm for exhibition, not only for the premiums offered, but to disseminate the results attained by the methods of the progressive farmers.

One of the noticeable deficiencies, both at our county and State fairs, there is not enough stock from the farm exhibited, the display being almost exclusively made by the professional breeders. It does not pay farmers in dollars and cents to take their stock to the fairs for the premiums offered, as they stand but a slight chance in the show-ring with the professional breeders.

I would recommend that there be a separate department for the farmers' stock, as kept on the farm, in which could be exhibited the cow for the dairy, the steer for beef, the calves being raised for milk and butter, for beef, and for breeding purposes; the same in the swine department. With such an exhibition farmers could compare their stock with their brother farmers, instead of competing with the highly pampered stock of the professional breeders. Such a department would add to the display, and be of value and very instructive to the visitors at the fair.

The number of hogs exhibited was not so large as last year; yet the majority of the pens were filled, and what was lacking in quantity was made up in quality, as the animals exhibited have never been excelled at any previous fair.

There were exhibited 137 hogs and 45 pigs, making the number on exhibition 182 head; in pens for sale, 101; total number, 283 head, and representing five different or distinct breeds, as follows:

Berkshires. Poland-Chinas, Chester Whites, Duroc Jerseys (red hogs), and Suffolk and Yorkshire breeds.

The present arrangement of pens is very satisfactory to exhibitors, as far as convenience and comfortable quarters for keeping swine during the fair, and the only suggestion I would offer in the way of improvement in the building of pens on the new fair grounds, would be to have the roof a few feet higher, thus affording more light in the aisles, which is used as the exhibition ring for competing animals, so that the committee could more readily detect any defective points with sufficient clearness to make contrasts. More light is especially needed on cloudy days, as was the case this year, and often the closely matched animals had to be changed near the open end of the building before the committee could make a satisfactory decision to themselves or the exhibitors.

Tuesday, September, 3d at the stated hour, 10 o'clock a. m., the committee appointed for this day, consisting of Albert Deyo, of Morenci, Michigan; James Hankinson, Maron, Illinois; and S. H. Todd, Wakeman, Ohio, entered upon the duties assigned them.

The first class called were Suffolk and Yorkshire breeds (Entry Book 41). They are a small white breed, with a small head, very short cheeks, full face, dished snout, small and very short jole, fine, short ears, brisket wide, but not deep, good length between shoulder and ham for the sized hog, hair fine and silky; and their advocates claim for them that they furnish an extra quality of meat for family use at a small cost.

Boar of any age.—There were five entries. John J. Maxon, Gallipolis, Ohio, entered Gus Yorkshire; John J. Maxon, Gallipolis, Ohio, entered Gallia; Thomas Bennington, Laporte, Ohio, entered Chieftain; J. G. Paxton & Sons, Houstonville, Pa., entered Smuggler, 165; J. G. Paxton & Sons, Houstonville, Pa., entered Rex 1st, 201. J. G. Paxton & Sons awarded first premium on Rex 1st, 201. John J. Maxon, second premium on Gus Yorkshire.

Sow of any age.—Seven entries. John J. Maxon, Gallipolis, Ohio, Lady John John J. Maxon, Gallipolis, Ohio, Lady Gallia; Thomas B. Bennington, LaPorte, Ohio, Glendale; J. G. Paxton & Sons, Houstonville, Pa., Princess 3d, 107; J. G. Paxton & Sons, Houstonville, Pa., Mollie Peader, 309; Charles McClave, New London, Ohio, first premium on entry No. 21. J. G. Paxton & Sons, Houstonville, Pa., second premium on Princess 3d, 207.

The second class or breed called was Entry Book 41.

DUROC OR JERSEY RED.

This breed has very staunch friends among its advocates and some stronger enemies among its opponents than probably any other breed. As the name indicates, the hair is reddish, of the shade known as sandy red. They are large and somewhat coarse looking, and are generally credited with being good feeders, prolific breeders, and less subject to disease (cholera) than any other breed; but I am not fully prepared to admit this claim as correct. From personal observation and frequent inquiries made of the shippers of this stock, while I was in the live stock commission business, at the Union Stock Yards, Cincinnati, Ohio, several years, never learned that any special breed was any more or less exempted from disease than others were.

Boar one year old and under two.—There were only two entries. M. Pond, Logan, Ohio, entered Red Rover; first premium. James H. Valentine, Duvalls, Ohio, Enterprise, 383; second premium.

Boar six months and under one year.—James H. Valentine, Duvalls, Ohio; second premium. Samuel Taylor, Pleasant Corner, Ohio, first premium.

Sow two years and over.—Two entries. Samuel Taylor entered Kate 2d, 670; first premium. Samuel Taylor entered Mollie Gold Dust, 672; second premium.

Sow one year and under two.—Three entries. M. Pond, Logan, Ohio, entered Belle. James H. Valentine, Sallie of Duvall, 2012, 2d. Samuel Taylor, Taylor's Rose-bud, 1570, first premium; and Mollie Gold-Dust second.

Sow six months and under one year.—Three entries. M. Pond, Logan, received first premium on Beauty, and Samuel Taylor, Pleasant Corner, second, on Violet, 2596; eleven months old.

The Committee on Awarding Premiums completed their awards on Book 41 and 42 in time for dinner Tuesday.

Tuesday, 1½ o'clock p. m., the committee reported ready for further work, one of the committee, S. H. Todd, having stock entered in Book 39. *Chester Whites* was excused from further service, and Joseph Allen, of Gano, appointed to fill the vacancy.

CHESTER WHITES.

The Chester Whites are a large white variety that have their origin from Chester county, Pennsylvania. In form it favors the Poland China; though white, it might occasionally show blue spots; in form the body is long, deep, broad chest; large head in proportion to size; medium small ears, and some what dishd face; it is claimed for the pure stock early maturity, quiet disposition, and good fattening and breeding qualities.

Boar two years and over.—Two entries. S. H. Todd, Wakeman, exhibited Grand 3d; J. H. & H. P. Eaton, Bucyrus, Gen. Hancock. Both were fine specimens, and after a careful examination, the committee awarded first premium to Grant 3d, owned by S. H. Todd; and second to Gen. Hancock, owned by J. H. & H. P. Eaton.

Boar one year and under two.—Six entries. C. W. Baker, Mansfield; S. H. Todd, Wakeman, Grant 4th; W. Minns, New London, White Star; W. Minns,

New London, Slim Tail, 329; J. H. & H. P. Eaton, Bucyrus, Cleveland, 67; J. H. & H. P. Eaton, Bucyrus, Eaton's King, 123; first premium, Grant 4th; owned by S. H. Todd; and W. Minns on Slim Tail, 329, second.

Boar six months and under one year.—Four entries. C. W. Baker, Mansfield; S. H. Todd, Captain, second premium; H. W. Minns, Oscar Wilde; J. H. & H. P. Eaton, Bobb, first premium.

Boar under six months old.—Five entries. C. W. Baker showed one; S. H. Todd two, Hannibal and George; H. W. Minns one; and J. H. & H. P. Eaton one; S. H. Todd received first on George; J. H. & H. P. Eaton second.

Sow two years and over.—S. H. Todd entered two, Clo and Lady Rose; J. H. & H. P. Eaton, Sweepstakes, 708; J. H. & H. P. Eaton, of Bucyrus, received first on Sweepstakes, 708; and S. H. Todd, of Wakeman, second on Lady Rose.

Sow one year and under two.—Four entries in this class. O. W. Baker one, S. H. Todd, Lady Bates 4th; J. H. & H. P. Eaton, Belle, 752 and Holmes Belle 2d; S. H. Todd, of Wakeman, received first on Lady Bates 4th; and J. H. & H. P. Eaton, of Bucyrus, second on Holmes Belle 2d.

Sow six months and under one year.—Five entries. C. W. Baker one; S. H. Todd, Laporte 6th; H. W. Minns, Cleopatra, and J. H. & H. P. Eaton, two entries, Sallie T. 6th and Little Queen; J. H. & H. P. Eaton received first on Sallie T. 6th, and second on Little Queen.

Sow under six months old.—Five were shown in this class. C. W. Baker one, S. H. Todd two, Cord and Vitality; H. W. Minns and J. H. & H. P. Eaton one each; S. H. Todd, of Wakeman, received first on Vitality and second on Cora.

Sow with litter of pigs.—In this class were four entries. C. W. Baker, sow with five pigs; S. H. Todd showed Wakeman Belle with seven pigs; H. W. Minns, Belle of Lorain, 62, with ten pigs; and J. H. & H. P. Eaton, Sallie T. 6th, with six pigs. They were all fine specimens, and showed the skill in selection and breeding for improving their stock. This was one of the most difficult classes for the committee to decide, but after a careful and thorough examination, taking age and condition of both mother and pigs, and with the general appearance combined, H. W. Minns received first on Belle of Lorain, 62, and second to S. H. Todd on Wakeman Belle.

This finished up the work of the committee for Tuesday on Book 41, Suffolk and Yorkshire; Book 42, Duroc or Jerseys; and Book 39, Chester Whites. They were then discharged from further duty, having done their work promptly, efficiently, and satisfactorily to the exhibitors and the member in charge.

Judging by scale of points, as adopted by the American Berkshire and the Ohio Poland China records, as recommended by the member in charge last year of selecting an expert committee of one for each breed, was adopted and tested for the first time, and I am happy to report, gave the best of satisfaction, and the only exception taken by any of the exhibitors, they wanted a copy of the scale of points given each animal they exhibited, so as to learn of the defective points. This request was not granted by the member in charge, and his decision meets my approval; but I will record the total number of points each animal exhibited received.

BERKSHIRES.

The Berkshire is of English origin, and has been established many years. While not as large as the Chester Whites or Poland-Chinas, it has many excellent qualities, admitted by all hog-raisers. Color, black, with white spots on feet, face, tip of tail, and an occasional spot of white on the shoulders; face short, and a little dished; broad between the eyes; ears almost erect, soft and

thin; jole full; neck short and thick; broad and straight on back; hams thick, round, and deep, holding their thickness well down the hock. These are mostly the striking characteristic points of the Berkshires.

A committee of one was selected (an expert) on judging by scale of points on awards for Berkshire classes, and one for the Poland-China classes, met the approval of the Board of Directors.

J. H. Brotherton, of Cedarville, Greene county, Ohio, was selected on Berkshire classes, and Jas. Hankinson, of Maroa, Illinois, on Poland-China classes.

WEDNESDAY MORNING, *September 2*—10 O'CLOCK A.M.

J. H. Brotherton, the expert on Berkshires, commenced the arduous duties assigned him, scoring by scale of points, as adopted by the American Berkshire Association, as follows:

Color 4, face and snout 7, eyes 2, ears 4, jole 4, neck 4, hair 3, skin 4, shoulder 7, back 8, sides 6, flank 5, loin 9, ham 10, tail 2, legs 5, symmetry 5, condition 6, style 5; total 100.

Boar two years and over.—G. W. Penny, Newark, exhibited Royal Gloster, 10195. He scored 72 points; received second premium. D. W. Todd & Sons, Urbana, exhibited Royal-Oxford, 10042. He scored 63 points; received first premium.

Boar one year and under two.—D. W. Todd & Sons, of Urbana, exhibited Duke of Morgan, 12220; scale of points, 96. This was the only exhibit in this class, and it is just to say that it is probable he would have taken first if there had been a score exhibited, as this animal only lacked four points of perfect scale of points.

Boar six months and under one year.—Boar, St. Charles, 13447; scale of points, 75; D. W. Todd & Sons, Gen. Hancock, 14091; scored 88; received first premium; Clifford & White, New London, Wilmington-Bismarck; scored 84; second premium.

Boar under six months.—G. W. Penny exhibited Queen Gloster; score 81; D. W. Todd & Sons, Gen. Sherman, 14095; score 85; Clifford & White, Vim; scored 83, and Don scored 84. D. W. Todd & Sons, first on Gen. Sherman, 14095, and Clifford & White, New London, second on Don.

Sows two years and over.—G. W. Penny, Juliette, 10193; scored 79; D. W. Todd & Sons, Lady Ambrose, 11845; scored 89; Clifford & White, Darling, 11131; scored 85; D. W. Todd & Sons, first on Lady Ambrose, 11845; Clifford & White, second premium on Darling, 11131.

Sow one year and under two.—D. W. Todd & Sons exhibited Queen of Ohio, 14088; scored 86, was awarded first premium.

Sow six months and under one year.—G. W. Penny exhibited Countess, 13446; scored 82; D. W. Todd & Sons, Lady Gordon, 14093; scored 86; and Lady Grant, 14092 by same; scored 85; Clifford & White, New London, on Gem, 13903; scored 87, and received first, and D. W. Todd & Sons, Urbana; second on Lady Gordon, 14093.

Sow under six months.—Clifford & White, New London, exhibited Fannie Fern; scored 83, and received second premium, and Happy by same, scored 86; received first.

Sow and litter of pigs.—One entry by Clifford & White, sow and eight pigs, 13901; first premium.

ENTRY BOOK 38—POLAND CHINA BOARS.

This breed, as a general rule, are more fully represented both at our county and State fairs than any other breed. Its great size and quiet disposition make it a very popular breed among all the farmers of the West, and throughout the great corn belt none are to be found in greater numbers or more generally esteemed. They undoubtedly possess both early maturity and good fattening qualities. This breed is of American origin, and of comparatively recent date. They were first extensively bred in Southern Ohio. In color it is black, with white spots, which are quite irregular; jole heavy; ears a little drooping; short snout; lengthy from shoulders to hips, with large hams, and thus making a very large per cent. of high-priced meat.

The following scale of points has been adopted by the American Poland-China record: Eyes 2, head 6, ear 3, neck 3, jole 2, brisket 3, shoulder 5, girth 9, back 6, sides 7, ribs 6, loin 7, belly 5, flank 3, ham 9, coat 3, limbs 8, tail 2, color 3, symmetry 8; total 100.

The committee of one, Jas. Hankinson, of Maroa, Illinois, commenced the arduous task of awarding premiums to the Poland-China classes by scale of points, as recorded above. The first class called was—

Boar two years and over.—There were two entries in this class. Lon Hunter, Morrow, Warren county, exhibited U. S. 2d, 6227; scored 90 points; received premium; H. Bradford, Rochester Depot, exhibited London Boy, 4003; score of points 87, second premium.

Boar one year and under two.—Four entries. Frank Plessinger & Bro., Beamsville, Ohio, exhibited Grover C., scored 87; Alf. Slade, Jaysville, Ohio, exhibited Bravo K., scored 90; L. C. Nixon, Ft. Ancient, Ohio, Cleveland No. 6799, scored 88; H. Bradford showed Perfection No. 768, scored 93, and received premium, and Alf. Slade, of Jaysville, Ohio, second premium on Bravo K.

Boars six months and under one year.—Lon Hunter, Morrow, Monarch 2d, scale of points 89; Richardson & Magrew, Westville, Ohio, exhibited Aaron Mc, score 86; same, Black Joe, score 88; L. C. Nixon, (not named), score 91; Lampe Bros., of Van Wert, Ohio, King's Cousins, score 93; same, Jumbo, score 84 points. Lampe Bros., on King's Cousins, first premium; L. C. Nixon, Ft. Ancient, Ohio, second premium.

Boar under six months.—Six exhibited. Frank Plessinger & Bro., one, score 89; Z. T. Smith & Bro., Upper Sandusky, score 83; Alf. Slade, Black Dick, score 85; L. C. Nixon, one, score 92; Lon Hunter, U. S., Jr., score 88; Lampe Bros., Black Tom, scale of points 84. L. C. Nixon, first premium, scale of points 92; Frank Plessinger & Bro., second, scale of points 89.

POLAND CHINA SOWS.

Sow two years and over.—Five entries. Frank Plessinger & Bro. exhibited Black Bess No. 11444, scale of points 89; L. C. Nixon, Daisy Dean 3d, No. 12106, scale 91; same, Mother Hubbard No. 9702, scale 88; Lon Hunter, Lady Warren No. 13620, scale 92; Lampe Bros., Lady Hunter, scale of points, 93. Lon Hunter, Morrow, Ohio, second premium on Lady Warren, No. 13620.

Sow one year and under two.—Five entries. Frank Plessinger & Bro., Princess, score 91; L. C. Nixon, Bonnie Belle No. 16668, score 90; Lon Hunter, Maud, scale 90; Lampe Bros. exhibited one, scale 90; H. Bradford, Rochester Depot, Reno, scored 93. Reno received first and Princess second premium.

Sow six months and under one year.—There were eight entries in this class, but only four exhibited. Richardson & Magrew, Westville, Ohio, Abby Mc, scale

90; Lon Hunter, Beauty, scale 90; Lampe Bros., Lulu, scale 92; same, H. L., scale of points, 93. Lampe Bros., Van Wert, Ohio, received first premium on H. L., and second on Lulu.

Sow under six months old.—Nine entries and six exhibited. Frank Plessinger & Bro., one exhibit, scale 88; Z. T. Smith & Bro., scale 85; Alf. Slade, Blackmaid, scale 86; L. C. Nixon, Ohio Belle 2d, scale 91; Lon Hunter, Daisy H., scale 90; H. Bradford, Rochester Depot, Ohio, exhibited Perfect, scale 93 points. Perfect awarded first and Ohio Belle second.

SWEEPSTAKES.

A new committee to pass on animals for sweepstakes was regularly constituted, consisting of the following gentlemen: G. W. Brown, Mt. Gilead, Ohio, Philip Poe, Milford Center, Ohio, and J. H. Pringle, Cardington, Ohio.

At 10 o'clock Thursday morning, September 3, the Committee organized and commenced the work assigned them.

Boars of any age.—There were eight entries, all fine animals of their respective classes and representing four distinct breeds. James H. Valentin, Duvalls, Ohio, Daroc, Jersey Enterprise No. 383; D. W. Todd & Sons, Urbana, Ohio, Berkshire, Duke of Morgan No. 12220; J. H. & H. P. Eaton, Bucyrus, Ohio, Gen. Hancock, Chester White; Alf. Slade, Jaysville, Poland China, Bravo K; L. C. Nixon, Ft. Ancient, exhibited Cleveland No. 6799, age 15 months; Lampe Bros., King Corwin; Lon Hunter, Morrow, Ohio, U. S., Jr., No. 6227; H. Bradford, Rochester Depot, Ohio, Perfection No. 7685. After a careful examination was made of all the competing animals, the committee awarded the premium to H. Bradford on Perfection. Their decision was unanimous, and all parties were satisfied as Perfection had received the highest score of points in his class of boars one year and under two years. His score was 93.

Sow of any age.—There were nine entries, representing three breeds, one Berkshire, one Chester White, and seven Poland Chinas. Frank Plessinger, Princess; D. W. Todd, Lady Ambrose No. 11845; Richardson & Magrew, Abba Mc; J. H. & H. P. Eaton, one; Lon Hunter, Lady Warren No. 13620 and Maud; H. Bradford, Reno; Lampe Bros., Lady Hunter. Lampe Bros. were awarded sweepstake premium on Lady Hunter; this sow had taken first premium in her class, and scored 93 points.

Herd of one boar and three sows.—In this class there were five entries, making the total number exhibited twenty head, two herds of Chester Whites and three of Poland Chinas. These were all the finest of herds, equal to any former exhibit, if not the best. S. H. Todd exhibited boar Gen. Grant 2d, sows Clo, Lady Laport 6th, and Lady Bates 5th; Richardson & Magrew, boar no name, sows Dottie Mc, Abba Mc, and Alice Mc; J. H. & H. P. Eaton, boar no name, sows Wakeman Belle, Libby, and Holmes Bell; L. C. Nixon, boar Cleveland, sows Daisy Dean 3d No. 12106, Mother Hubbard No. 9702, Doney Belle 2d, No. 16668; Lon Hunter, U. S. 2d, Lady Warren, and Beauty. These herds of one boar and three sows taxed to the full extent the judgment of the committee, but after the most critical examination of each herd, L. C. Nixon, of Ft. Ancient, Ohio, was awarded the sweepstakes premium on his fine herd of Poland Chinas.

Sow and three pigs.—One entry. S. H. Todd, Wakeman, O., Chester White sow and three pigs received sweepstakes premium.

Best three boars under one year old, all of one breed, and bred by the exhibitor.—Four entries. S. H. Todd, Richardson & Magrew, J. H. & H. P. Eaton, and L. C. Nixon. The committee awarded sweepstakes premium to S. H. Todd on Chester Whites.

Herd of three sows under six months old.—Six entries. S. H. Todd, Chester

Whites; D. W. Todd, Berkshires; Richardson & Magrew, J. H. & H. P. Eaton, L. C. Nixon and Lon Hunter Poland Chinas. The committee awarded sweepstakes premium to J. H. & H. P. Eaton on Chester Whites, of three sows of one litter eleven months old and averaging 325 pounds; after weaning they were fed on middling, mixed with sour skim milk.

Fat hogs.—One entry. Barrow owned by S. H. Todd, 14 months old, weight 505 pounds, awarded first premium.

Fat barrow under one year old.—One entry. Barrow owned by S. H. Todd, ten months old, weight 375 pounds, awarded first premium.

Mr. S. H. Todd gave the following as his mode of raising and feeding swine: Feed for muscle and bone middling mixed with sour milk until six months old; for flesh, on mixed feed ground, of corn, barley and oats, made into slop, and let stand ten hours before feeding. He will feed these barrows for the coming Chicago Fat Stock Show.

In the sweepstakes classes there were four breeds exhibited, the premiums amounting to \$145.00, and was awarded as follows: Poland Chinas, \$95.00; Chester Whites, \$75.00.

The committee on Sweepstakes finished their task at three o'clock Thursday afternoon, and in view of the exceedingly close contests in many of the classes, it is remarkable with what unanimity they came to their decision in almost every class, and to the credit of the exhibitors they accepted their decisions without complaint.

And now, in conclusion, I wish to return my thanks to the member in charge, L. N. Bonham, and to the Superintendent, W. B. Wallace, and to all the exhibitors for prompt and kindly attention, generous treatment, and their readiness to give your Reporter any and all information when asked.

All of which is respectfully submitted.

REPORT UPON THE FARM PRODUCT EXHIBIT.

BY WM. B. ATWOOD.

[NOTE.—For awards in this department, see pages 128 to 138 of this Bulletin.]

To the Ohio State Board of Agriculture :

In the absence of any precedent and of definite instructions, your reporter has sought simply to state the facts and chronicle the events that seemed to be most interesting and instructive.

CLASSIFICATION OF EXHIBITS.

The value of an exhibition of this kind is in its power to teach as an object-lesson, and when this is lost sight of, it detracts very much from the merit and real value of the exhibit. In the old hall on the Franklin County grounds it would be useless to attempt a proper classification of articles, but in view of the fact that new buildings are in course of erection, we would suggest that due attention be given to the important matter of properly *classifying and labeling* the exhibits. Your reporter experienced considerable difficulty in learning the names of varieties of wheat to which were awarded the various premiums, and, in fact, could not learn some of them even after spending much time in overhauling and untying promiscuous heaps of sacks containing grains and seeds.

We think it would be a great advantage to committeemen, and especially advantageous to those desiring to study the exhibits, if articles of a kind could be arranged in sections in such a manner as to practically shut out the sight of other objects. Where a sweeping view of a large display is desired, this would be objectionable, but for varieties of grains and vegetables entered for competition, such an arrangement would facilitate the work of committees and add much to its value from an educational point of view.

Then the labeling of exhibits is a matter of vital importance, and we believe that it is time the State Board should exact from exhibitors in this department the same care and precision in this regard that they do of exhibitors of live stock.

The removal of articles before the time specified in the "Rules and Regulations," is a matter which demands summary punishment, by forfeiture of premiums, or otherwise. We found this to be quite common, as we had to insist on some parties replacing their exhibits for our further examination.

AWARDING COMMITTEES.

We desire to say a few words concerning the work of committees in a general way, and we do so knowing well the difficulties of the position. If it were possible for the Superintendent to so well enforce the rules of the Board as to have sufficient time for his committees, and have but one acting at a time, his duties would be lightened and the awarding done with greater dispatch and satisfaction to all concerned. But it seems impossible to get any of the committees together until Wednesday afternoon, or Thursday morning; then the work must be rushed, and several committees must act at the same time, which makes it unpleasant for exhibitors, the Superintendent, and almost impossible for your reporter to observe the work of each committee as they proceed.

We do not doubt that committees are selected with great care, and that their work is conscientiously performed in nearly every case, but sometimes abuses

will creep into this system of awarding, despite the utmost vigilance. A very flagrant attempt was made by one party during this exhibition to prostitute one of the committees to private ends, by a gentleman who in some manner got possession of the regular notice to serve on committee which was intended for another party. He assumed the name of the party to whom the notice was addressed, and took his place on the committee which was to pass on a book in which his brother was a large exhibiter, but the true state of affairs was discovered, and the Superintendent placed another man on the committee in his stead. From observation at this Fair and elsewhere, we are firmly convinced that one paid judge would in most cases be an improvement over the present system, both in dispatching business and giving general satisfaction to exhibitors.

OWNERSHIP OF ARTICLES.

It is specifically stated in the "Rules and Regulations" of the Board that competition in this hall shall be confined to producers. Yet this rule is most flagrantly violated, and in fact it has become a standard expression among exhibitors, when spoken to about the matter of purchasing their exhibits, that "others do the same."

This and other abuses have grown upon this department until the competition is confined to professionals, or "fair followers," as they are better known, whose only desire is to rake in the premiums, regardless of methods. There are, of course, a few exceptions to this, but I have rarely observed a non-professional coming back the second year. These remarks apply especially to grains, grasses, and vegetables.

We shall have occasion to refer especially to certain exhibits while giving the awards in detail.

FLOUR.

The flour exhibit was small, but two firms competing, viz., Marfield & Co., Chillicothe, Ohio, and Maxwell, Heckerand & Pomerene, Millersburg, Ohio. The first named was awarded first, on a barrel of red wheat flour; the latter second on same. There were no entries of white wheat flour. The display of Marfield & Co. was quite creditable. The exhibit of cereal grains, seeds, etc., was large, and generally of good quality, but from necessity so poorly placed as to be almost valueless as an educational exhibit.

CORN.

The exhibit of corn was very large and good, so far as a collection of ears of different types and colors is concerned, but there was scarcely a sample that did not betray the fact that the grower, or collector, had no fixed type of ear in mind toward which he was improving his corn.

CHEESE.

There was no competition in this exhibit, the entries all being by one man, Mr. E. A. Fobes, of Lindenville, Ohio. The exhibit was excellent in quality, and it is certainly to be regretted that this very important industry can not be induced to compete. Dairymen stated that the premiums were not sufficient to warrant them in competing. The premiums in this book aggregate sixty dollars in cash, and two silver medals, which certainly is not much in the way of cash remuneration to compete for, but would not friendly rivalry be worth something as an educator, and their success be valuable as an advertisement in business? This, we think, is worthy of consideration by dairymen.

The exhibit of Mr. Fobes comprised Factory, Domestic, and Cheddar brands, and was in every way creditable. He received all of the awards.

Statement of the way E. A. Fobes manufactures cheese.—I set in vat last night's milk, stir occasionally in the morning, strain cream through a cloth strainer, turning through warm milk to dissolve it; set milk at 84 degrees with rennet enough to congeal it in sixty minutes; commence cooking slow at first, and cook until it reaches about 108 degrees; then, at the end of about thirty minutes, drain off the whey and salt, two pounds of salt to one hundred pounds of cheese; then stir occasionally until a slight acid develops when put to press.

E. A. FOBES, *Lindenville, Ohio.*

BUTTER.

The exhibit of butter was small, but that receiving the first award was pronounced by experts to be of excellent quality.

PRESERVES, PICKLES, ETC.

The exhibit of preserves, canned goods, pickles, etc., was very large and also a very creditable display. It embraced almost every conceivable thing which could be included under the above headings. This section presented quite an animated appearance at all times, and was the scene of strongest competition in the hall. The entries for each award were very numerous, and the committee had a herculean task to perform. There is always more or less strife over the awards in this book, at least there has been considerable of late years, and your reporter would urgently suggest that a committee of competent persons be authorized to revise the premium list for this class of articles. Several ladies complained that great injustice was done them by the indefinite wording of the premium list; for instance, in variety of canned fruit no restriction whatever is placed upon the number of cans to be exhibited or what they shall contain, just so it is fruit, and persons taking advantage of this have prepared a *fair exhibit* of every conceivable thing which can be called a fruit, without regard to worth and practical utility. Some of this *stuff* can be and is kept year after year just to take in the premiums, and practical women showing fruit put up for *domestic* purposes are effectually debarred from receiving awards. These remarks apply equally to displays of fruit, jellies, pickles, etc. The ladies also requested that we recommend a premium for displays of preserves and for the different fruit butters.

POTATOES AND OTHER ROOT CROPS.

The display of potatoes was not nearly so large or fine as usual, doubtless because the season was so late in northern Ohio.

The show was fairly good, however, and with better arrangements and labeling would have been interesting indeed.

VEGETABLES.

This book comprised the tomatoes, cabbage, squashes, melons, sweet corn, beans, etc.

In closing this report, I wish to tender my sincere thanks to Mr. John Pow, member of the board in charge, and especially to Mr. Frank O. Levering, Superintendent, and George Pow, Assistant Superintendent, for their kindness and assistance during the time we were associated together.

COUNTY FAIRS IN OHIO FOR 1885.

Counties.	President.	Post-office.	Treasurer.	Post-office.
Adams.....	J. B. Roberts.....	Lima.....	W. E. Watkins.....	Delphos.....
Allen.....	M. France.....	Ashland.....	G. W. Urie.....	Ashland.....
Ashland.....	E. G. Hurlburt.....	Hartgrove.....	E. S. Sampson.....	Jefferson.....
Ashtabula.....	J. S. Higgins.....	Athens.....	L. Hawk.....	Athens.....
Athens.....	John H. Werst.....	Wapakoneta.....	M. Lucas.....	Uniaapolis.....
Anglaize.....	J. B. Hoge.....	St. Clairsville.....	John Pollock.....	St. Clairsville.....
Belmont.....	J. P. Richards.....	Georgetown.....	E. F. Bair.....	Georgetown.....
Brown.....	Peter Murphy.....	Hamilton.....	Thos. V. Howell.....	Hamilton.....
Butler.....	Joseph McGregor.....	Carrollton.....	C. G. Fawcett.....	Carrollton.....
Carroll.....	C. H. Ganson.....	Urbana.....	Thos. McConnell.....	Urbana.....
Champaign.....	J. S. R. Hazzard.....	Springfield.....	D. P. Jeffries.....	Springfield.....
Clarke.....	A. F. Queal.....	Mt. Repose.....	J. W. Duckwell.....	Batavia.....
Clermont.....	Leo Weltz.....	Wilmington.....	C. W. Swain.....	Wilmington.....
Columbiana.....	A. H. Phillips.....	Salem.....	Dan. W. Firestone.....	New Lisbon.....
Coshoccon.....	Lewis Demoss.....	Coshoccon.....	Joseph S. Rue.....	Coshoccon.....
Crawford.....	E. B. Monnett.....	Bucyrus.....	F. P. Naler.....	Bucyrus.....
Cuyahoga.....	Wm. Hutchings.....	Chagrin Falls.....	Arthur Williams.....	Chagrin Falls.....
Darke.....	H. Coblenitz.....	New Madison.....	S. A. Hostetter.....	Ansonia.....
Defiance.....	Wm. C. Holgate.....	Defiance.....	Chas. P. Tittle.....	Defiance.....
Delaware.....	J. T. Hutchinson.....	Delaware.....	George Neilson.....	Delaware.....
Erie.....	T. B. Taylor.....	Sandusky.....	Henry Graefe.....	Sandusky.....
Fairfield.....	Henry Langle.....	Lancaster.....	A. I. Vays.....	Lancaster.....
Fayette.....	M. A. Neil.....	Columbus.....	N. A. Sims.....	Columbus.....
Franklin.....	L. G. Ely.....	West Unity.....	James W. Howard.....	Wauseon.....
Fulton.....	Chas. D. Bailey.....	Gallipolis.....	John J. Pool.....	Gallipolis.....
Gallia.....	A. A. Jones.....	Parkman.....	C. J. Scott.....	Burton.....
Gauga.....	John B. Lucas.....	Xenia.....	David Millen.....	Xenia.....
Greene.....	E. M. Creighton.....	Washington.....	R. S. Frame.....	Washington.....
Guernsey.....	Albert French.....	Oakley.....	N. S. Buxton.....	Pleasant Ridge.....
Hamilton.....	S. D. Fray.....	Findlay.....	J. M. Vanhorn.....	Vanue.....
Hancock.....	A. Letson.....	Kenton.....	G. S. Binckley.....	Kenton.....
Hardin.....				

COUNTY FAIRS IN OHIO.—Continued.

Counties.	President.	Post-office.	Treasurer.	Post-office.
Harrison.....	Andrew Smith.....	Cassville.....	W. S. Cessna.....	Cadiz.....
Henry.....	H. R. Andrew.....	Napoleon.....	.....	.....
Highland.....	Isaac Larkin.....	Hillsboro.....	E. B. Overman.....	Hillsboro.....
Hocking.....	M. Pond.....	Logan.....	James Little.....	Logan.....
Holmes.....	J. J. Sullivan.....	Millersburg.....	John E. Koch.....	Millersburg.....
Huron.....	J. F. Randolph, Jr.....	Milan.....	F. A. Powers.....	Norwalk.....
Jackson.....	.....	.....	.....	.....
Jefferson.....	Chas. Burriss.....	Smithfield.....	Charles McKinney.....	Smithfield.....
Knox.....	John R. Wilson.....	Mt. Vernon.....	B. S. Cassel.....	Mt. Vernon.....
Lake.....	J. H. Wood.....	Madison.....	S. L. Thompson.....	Painesville.....
Lawrence.....	Nelson Cox.....	Bradrick.....	James M. Kelly.....	Ironton.....
Licking.....	William Veach.....	Newark.....	Wm. A. Veach.....	Newark.....
Logan.....	Thos. Cooke.....	Bellefontaine.....	J. B. Williams.....	Bellefontaine.....
Lorain.....	A. H. Mooers.....	Elyria.....	E. G. Johnson.....	Elyria.....
Lucas.....	T. S. Merrell.....	Toledo.....	George W. Davis.....	Toledo.....
Madison.....	.....	.....	.....	.....
Madison.....	J. W. Canfield.....	Canfield.....	.....	.....
Mahoning.....	D. H. Harvey.....	Marion.....	G. S. McGuire.....	Marion.....
Marion.....	William Witter.....	Medina Village.....	R. M. McDowell.....	Medina Village.....
Medina.....	.....	.....	.....	.....
Meigs.....	.....	.....	.....	.....
Mercer.....	Chris. Maner.....	Mendon.....	J. C. Porterfield.....	Fort Recovery.....
Miami.....	F. B. McNeal.....	Troy.....	I. N. Brice.....	Troy.....
Monroe.....	I. P. Farquhar.....	Woodsfield.....	W. C. Mooney.....	Woodsfield.....
Montgomery.....	.....	.....	.....	.....
Morgan.....	E. R. Swayne.....	McConnelsville.....	W. A. Vincent.....	McConnelsville.....
Morrow.....	Wm. Brooks.....	Climax.....	S. W. Trowbridge.....	Mt. Gilead.....
Muskingum.....	H. C. Chappellear.....	Hopewell.....	Charles Gorsuch.....	Zanesville.....
Noble.....	William S. Sorrigs.....	Sarahsville.....	Joel T. Davis.....	Sarahsville.....
Ottawa.....	William A. Wonnell.....	Port Clinton.....	John J. Robinson.....	Port Clinton.....
Paulding.....	J. B. Cromley.....	Paulding.....	A. C. McAdow.....	Paulding.....
Perry.....	Samuel Arnold.....	New Lexington.....	Thos. J. Smith.....	New Lexington.....
Pickaway.....	.....	.....	.....	.....
Pike.....	.....	.....	.....	.....

Portage	N. S. Olin.....	Streetsboro.....	George W. Freeman.....	Ravenna.....
Preble	W. H. Snyder	Lewisburg.....	W. H. Ortt.....	Eaton.....
Putnam	Kemp Samsal.....	Kalida	N. E. Matthews.....	Ottawa.....
Richland.....	M. Carter.....	Mansfield.....	M. D. Ward.....	Mansfield.....
Ross.....	James C. Foster	Higby	Theo. Spetnagel.....	Chillicothe.....
Sandusky	Wm. B. Kridler, Jr.....	Fremont.....	D. A. Ranch.....	Fremont.....
Scioto	H. S. Grimes	Portsmouth.....	E. F. Draper.....	Portsmouth.....
Seneca	E. T. Stickney	Republic	H. J. Weller.....	Tiffin.....
Shelby	Isaac Betts.....	Hardin	O. J. Taylor.....	Sidney.....
Stark.....	A. R. Hanna.....	East Greenville.....	George D. Harter.....	Canton.....
Summit	Peter Lepfer	Middleburg.....	A. T. Paige.....	Akron.....
Trumbull	S. E. Bartlett.....	Warren	W. W. Post.....	Warren.....
Tuscarawas.....	John A. Wagner	Canal Dover	C. H. Slinguff.....	Canal Dover.....
Union.....	D. Reed	Marysville	W. H. Robb	Marysville.....
Van Wert	George Lewis.....	Van Wert.....	C. A. Melsheimer	Van Wert.....
Vinton	W. T. Whitacre.....	Morrow	Chas. H. Eulass.....	Lebanon.....
Warren.....	F. J. Cutter.....	Marietta	Henry Roesser.....	Marietta.....
Washington	C. G. Fay	Bryan	J. H. Ludigh	Bryan.....
Wayne	C. A. Powers	Perrysburg	Frank Yost	Tontogany.....
Williams.....	L. B. Harris	Upper Sandusky.....	Ed. A. Gordon.....	Upper Sandusky.....
Wood				
Wyandot				

COUNTY FAIRS IN OHIO FOR 1885.—Continued.

Counties.	Secretary.	Post-office.	Time of Fair.	Place of Fair.
Adams	S. Sanford	Lima	Sept. 22, 23, 24, 25	Lima.
Allen	S. Riddle	Ashland	Oct. 13, 14, 15, 16	Ashland.
Ashland	T. E. Hawley	Jefferson	Sept. 22, 23, 24, 25	Jefferson.
Ashtabula	J. W. Sands	Athens	Sept. 30, Oct. 1, 2	Athens.
Athens	Jacob Hauss	Wapakoneta	Sept. 29, 30, Oct. 1, 2	Wapakoneta.
Auglaize	J. B. Meyer	St. Clairsville	Sept. 2, 3, 4	St. Clairsville.
Belmont	W. H. Wilson	Georgetown	Oct. 5, 6, 7, 8, 9	Georgetown.
Brown	C. Rothenbush	Hamilton	Oct. 5, 6, 7, 8	Hamilton.
Butler	Milton W. Quilkin	Carrollton	Oct. 6, 7, 8	Carrollton.
Carroll	T. G. Keller	Urbana	Aug. 25, 26, 27, 28	Urbana.
Champaign	L. B. Sprague	South Charleston	Aug. 25, 26, 27, 28	Springfield.
Clarke	J. H. Burns	Monterey	Sept. 1, 2, 3, 4	Boston.
Clermont	N. M. Linton	Wilmington	Aug. 11, 12, 13, 14	Wilmington.
Clinton	Ed. A. King	New Lisbon	Sept. 22, 23, 24	New Lisbon.
Columbiana	L. W. Pocock	Coshocton	Oct. 13, 14, 15, 16	Coshocton.
Coshocton	G. W. Locke	Bucyrus	Sept. 22, 23, 24, 25	Bucyrus.
Crawford	S. A. McFarland	Chagrin Falls	Sept. 1, 2, 3, 4	Chagrin Falls.
Cuyahoga	J. N. Lowry	Greenfield	Sept. 14, 15, 16, 17, 18	Greenville.
Darke	E. P. Hooker	Defiance	Oct. 5, 6, 7, 8, 9	Defiance.
Defiance	W. E. Moore	Delaware	Sept. 15, 16, 17, 18	Delaware.
Delaware	Jno. T. Mack	Sandusky	Sept. 22, 23, 24, 25	Sandusky.
Erie	W. T. McClenaghan	Lan aster	Oct. 14, 15, 16, 17	Lancaster.
Fairfield	Geo. Donaldson	Columbus	No fair	
Fayette	H. L. Mosely	Wauseon	Sept. 16, 17, 18	Wauseon.
Franklin	P. T. Wall	Gallipolis	Sept. 16, 17, 18	Gallipolis.
Fulton	P. W. Parmelee	Burton	Sept. 14, 15, 16, 17	Burton.
Gallia	H. McQuiston	Xenia	Sept. 9, 10, 11	Xenia.
Gauga	V. D. Craig	Washington	Sept. 30, Oct. 1, 2	Washington.
Greene	S. B. Hammel	Carthage	Aug. 25, 26, 27, 28	Carthage.
Guernsey	D. Beardsley	Findlay	Sept. 30, Oct. 1, 2, 3	Findlay.
Hamilton	Ed. H. Wilson	Kenton	Sept. 8, 9, 10, 11	Kenton.
Hancock	Jacob Jarvis	Cadiz	Oct. 6, 7, 8, 9	Cadiz.
Hardin				
Harrison				

Henry	N. H. Hartman	Napoleon	Sept. 22, 23, 24, 25	Napoleon. Hillsboro.
Highland	Ed. L. Watson	Locan	Aug. 4, 5, 6, 7	
Hocking	A. H. Wilson	Millersburg	Sept. 29, 30, Oct. 1, 2	Millersburg. Norwalk.
Holmes	E. A. Uhl	Norwalk	Sept. 15, 16, 17, 18	
Huron	J. B. Kennon			
Jackson	R. F. Henderson	Smithfield	Sept. 23, 24, 25	Smithfield. Mt. Vernon.
Jefferson	Jer. Hess	Bladensburg	Oct. 6, 7, 8, 9	Painesville.
Knox	W. L. Baker	Painesville	Sept. 22, 23, 24, 25	
Lake	Jerry Davidson	Ironton	Sept. 15, 16, 17, 18	Ironton.
Lawrence	R. G. Smythe	Newark	Sept. 29, 30, Oct. 1, 2	Newark.
Licking	R. F. Tremain	Bellefontaine	Sept. 29, 30, Oct. 1, 2	Bellefontaine.
Logan	E. G. Johnson	Elyria	Sept. 29, 30, Oct. 1, 2	Elyria.
Lorain	Chas. Reed	Toledo	Sept. 7, 8, 9, 10, 11, 12	Toledo.
Lucas				
Madison		Canfield	Oct. 6, 7, 8	Canfield.
Mahoning	E. N. Brown	Marion	Sept. 29, 30, Oct. 1, 2	Marion.
Marion	J. E. Crow	Medina Village	Sept. 15, 16, 17	Medina Village.
Medina	Thos. S. Shaw			
Meigs	J. H. Beam	Celina	Sept. 8, 9, 10, 11	Celina.
Mercer	W. I. Tenney	Troy	Sept. 29, 30, Oct. 1, 2	Troy.
Miami	Geo. P. Door	Woodsfield	Sept. 1, 2, 3, 4	Woodsfield.
Monroe				
Montgomery		McConnelsville	Sept. 16, 17, 18	McConnelsville.
Morgan	J. W. McElhiney			
Morrow	J. G. Russell	Mt. Gilead	Oct. 6, 7, 8, 9	Mt. Gilead.
Muskingum	John A. Green	Zanesville	Sept. 8, 9, 10, 11	Zanesville.
Noble	Joseph Johnson	Sarabaville	Sept. 23, 24, 25	Sarabaville.
Ottawa	Geo. E. St. John	Port Clinton	Sept. 17, 18, 19	Port Clinton.
Paulding	V. V. Pursell	Paulding	Sept. 22, 23, 24, 25	Paulding.
Perry	Jas. C. Fowler	New Lexington	Sept. 22, 23, 24, 25	New Lexington.
Pickaway				
Pike				
Portage	K. S. Wing	Ravenna	Sept. 30, Oct. 1, 2	Ravenna.
Preble	Henry H. Fan	Eaton	Sept. 28, 29, 30, Oct. 1, 2	Eaton.
Putnam	Geo. H. Knapp	Ottawa	Oct. 7, 8, 9, 10	Ottawa.
Richland	W. E. Ford	Mansfield	Sept. 29, 30, Oct. 1	Mansfield.
Ross	H. W. Woodrow	Chillicothe	Aug. 18, 19, 20, 21	Chillicothe.
Sandusky	M. D. Weller	Fremont	Sept. 29, 30, Oct. 1, 2	Fremont.
Scioto	S. R. Ross	Portsmouth	Sept. 9, 10, 11	Portsmouth.
Seneca	W. S. Cramer	Tiffin	Sept. 29, 30, Oct. 1, 2	Tiffin.

COUNTY FAIRS IN OHIO FOR 1885—Continued.

Counties.	Secretary.	Post-office.	Time of Fair.	Place of Fair.
Shelby	G. C. Anderson.....	Sidney	Sept. 22, 23, 24, 25	Sidney.
Stark	J. F. Niesz	Canton	Sept. 28, 29, 30, Oct. 1, 2	Canton.
Summit	H. A. Peak	Akron	Oct. 6, 7, 8, 9	Akron.
Trumbull	E. D. Kennedy	Warren	Sept. 10, 11, 12	Warren.
Tuscarawas	S. M. McLean	Canal Dover	Oct. 6, 7, 8, 9	Canal Dover.
Union	A. H. Beightler	Marysville	Sept. 29, 30, Oct. 1, 2	Marysville.
Van Wert	O. D. Swartout	Van Wert	Sept. 10, 11, 12	Van Wert.
Vinton .....	.....	.....	.....	.....
Warren	M. A. Jameson	Lebanon	Sept. 22, 23, 24, 25	Lebanon.
Washington	Wm. B. Mason, Jr.	Marietta	Sept. 16, 17, 18	Marietta.
Wayne .....	.....	.....	.....	.....
Williams	T. Q. Waterhouse	Bryon .....	.....	.....
Wood	G. S. Ruder	Tontogany	Sept. 29, 30, Oct. 1, 2	Tontogany.
Wyandot	C. D. Hare	Upper Sandusky	Oct. 7, 8, 9, 10	Upper Sandusky.

COUNTY FAIRS IN OHIO FOR 1885.—Continued.

Counties.	No. of members.	Grounds owned or leased.	Value of grounds owned.
Adams			
Allen	235	Owned.	\$13,000 00
Ashland			
Ashtabula	310	Owned.	6,000 00
Athens			
Auglaize	1,426	Owned.	7,000 00
Belmont	190	"	6,000 00
Brown	558	"	4,000 00
Butler	3,250	"	35,000 00
Carroll	400	"	10,000 00
Champaign	50	"	3,200 00
Clarke	560	Leased.	
Clermont	779	Owned.	8,000 00
Clinton	783	Leased.	
Columbiana	541	Owned.	7,000 00
Coshocton	421	"	10,000 00
Crawford	302	"	10,000 00
Cuyahoga	418	Leased.	
Darke	1,938	Owned.	15,000 00
Defiance	137	"	10,000 00
Delaware	836	"	20,000 00
Erie	1,300	"	100,000 00
Fairfield	280	"	65,000 00
Fayette			
Franklin	50	Owned.	200,000 00
Fulton	257	"	7,500 00
Gallia	68	"	5,000 00
Geauga	722	"	8,000 00
Greene	337	Leased.	
Guernsey	207	"	
Hamilton	641	Owned.	50,000 00
Hancock	410	"	15,000 00
Hardin	210	"	14,600 00
Harrison	100	Leased.	
Henry	288	Owned.	10,000 00
Highland	384	Leased.	
Hocking	37	Owned.	1,000 00
Holmes	289	Leased.	
Huron	515	"	
Jackson			
Jefferson	310	Leased.	
Knox	214	Owned.	10,000 00
Lake	942	"	10,000 00
Lawrence	151	Leased.	
Licking		Owned.	100,000 00
Logan	2,549	"	14,000 00
Lorain	374	"	20,000 00
Lucas	52	"	55,500 00
Madison			
Mahoning	412	Owned.	5,000 00
Marion	486	"	20,000 00
Medina	400	"	4,000 00
Meigs			
Mercer	180	Owned.	8,000 00
Miami	24	"	10,000 00
Monroe	70	"	6,000 00
Montgomery			

COUNTY FAIRS IN OHIO FOR 1885—Continued.

Counties.	No. of members.	Grounds owned or leased.	Value of grounds owned.
Morgan	237	Owned.	\$5,000 00
Morrow	369	"	8,000 00
Muskingum	103	"	15,000 00
Noble	138	"	1,200 00
Ottawa			
Paulding	143	Owned.	3,000 00
Perry	300	Leased.	
Pickaway			
Pike			
Portage	746	Leased.	
Preble	2,885	Owned.	
Putnam	256	"	10,000 00
Richland	360	Leased.	
Ross	404	Owned.	
Sandusky	1,400	"	20,000 00
Scioto	50	Leased.	
Seneca	225	Owned.	10,000 00
Shelby	218	"	10,000 00
Stark	805	"	35,000 00
Summit	2,212	"	40,000 00
Trumbull	763	"	6,000 00
Tuscarawas	306	"	15,000 00
Union	2,600	"	12,000 00
Van Wert	750	"	6,000 00
Vinton			
Warren	2,720	Owned.	10,000 00
Washington	121	"	5,500 00
Wayne			
Williams	920	Leased.	
Wood	412	"	
Wyandot	485	Owned.	5,000 09
Per cent.....	45,321		\$1,119,500 00

Counties.	Thoroughbreds.			Roadsters.			General purpose.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Adams									
Allen	4	\$79 00	\$21 00	21	\$118 00	\$62 00	58	\$119 00	\$96 00
Asland									
Ashtabula				85	112 00	96 00	82	112 00	87 00
Athens									
Auglaize				19	17 00	17 00	51	71 00	69 00
Belmont	1	67 00	25 00	86	128 00		49	116 00	92 00
Brown				148	229 00	225 00	81	143 00	142 00
Butler					170 00	172 00	251	243 00	243 00
Carroll	48	119 00	95 00				77	119 00	119 00
Champaign				59	53 00	50 00	72	96 00	91 00
Clarke		125 00		63	144 00	125 00	54	128 00	107 00
Clermont	76	95 00	60 00	78	56 00	52 00	149	149 00	141 00
Clinton	9	57 00	23 00	53	177 00	141 00	67	144 00	132 00
Columbiana	6	43 00	31 00	77	85 00	77 00	82	85 00	75 00
Coshocton		75 00		62	170 00	145 00	66	190 00	163 00
Crawford				30	137 00	67 00	23	119 00	74 00
Cuyahoga				20	40 00	27 00	41	78 00	53 00
Darke	9	166 00	73 00	47	189 00	164 00	74	228 00	178 00
Defiance	4	77 00	25 00	16	104 00	50 00	49	127 00	106 00
Delaware	1			71	108 00	88 00	56	101 00	75 00
Erie									
Fairfield	12	190 00	85 00	80	650 00	635 00	79	140 00	132 00
Fayette									
Franklin									
Fulton	8	112 00	52 00	38	102 00	9 00	65	101 00	91 00
Gallia							41	91 00	64 00
Geauga	8	18 00	18 00	72	110 00	82 00	83	111 00	87 00
Greene	3	70 00	6 00	43	97 00	82 00	40	92 00	85 00

Morgan.....	2	42 00	6 00	29	34 00	34 00	90	75 00	67 00
Morrow.....	15	80 00	50 00	68	115 00	100 00	103	95 00	90 00
Muskingum.....	1	86 00	12 00	46	120 00	78 00	47	120 00	94 00
Noble.....	7	60 00	35 00	.....	.....	.....	25	135 00	85 00
Ottawa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paulding.....	2	87 00	16 00	.....	.....	.....	18	.....	72 00
Perry.....	2	.....	6 00	20	62 00	22 00	30	119 00	24 00
Piekaway.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pike.....	37	89 00	60 00	.....	.....	.....	78	70 00	57 00
Portage.....	12	125 00	78 00	65	150 00	146 00	85	150 00	149 00
Preble.....	3	25 00	25 00	25	31 00	26 00	55	111 00	88 00
Putnam.....	7	85 00	31 00	41	100 00	98 00	30	100 00	80 00
Richland.....	5	30 00	30 00	39	164 00	150 00	22	59 00	57 00
Ross.....	37	.....	.....	20	.....	.....	51	.....	.....
Sandusky.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scioto.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seneca.....	.....	.....	.....	38	172 00	93 00	32	150 00	105 00
Shelby.....	1	57 00	.....	66	143 00	109 00	74	197 00	124 00
Stark.....	27	149 00	115 00	78	182 00	147 00	97	295 00	215 00
Summit.....	27	168 00	99 00	60	200 00	137 00	64	200 00	151 00
Trumbull.....	.....	.....	.....	58	95 00	71 00	71	95 00	76 00
Tuscarawas.....	19	117 00	91 00	37	123 00	95 00	51	109 00	102 00
Union.....	42	139 00	134 00	110	79 00	77 00	85	79 00	79 00
Van Wert.....	3	69 00	15 00	8	34 00	18 00	39	78 00	60 00
Vinton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren.....	.....	.....	.....	25	60 00	60 00	71	141 00	137 00
Washington.....	.....	.....	.....	57	98 00	58 00	41	91 00	62 00
Wayne.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Williams.....	1	9 00	6 00	28	62 00	40 00	40	82 00	63 00
Wood.....	1	.....	.....	54	.....	.....	50	.....	.....
Wyandot.....	.....	.....	.....	40	137 00	134 00	20	137 00	126 00
Totals.....	509	\$3,548 00	\$1,698 00	2,900	\$6,957 00	\$5,494 00	4,701	\$7,817 00	\$6,541 00

Hamilton	40	99 00	87 00	69	385 00	385 00	52	52 00	52 00
Hancock	50	129 00	98 00	36	76 00	72 00	4	34 00	34 00
Hardin	42	121 00	104 00	2	5 00	5 00	52	89 00	81 00
Harrison	83	185 00	118 00	77	155 00	97 00	11	140 00	105 00
Henry	32			14					
Highland	28	112 00	88 00	28	100 00	98 00	17	60 00	60 00
Hocking	4	98 00	15 00	6	61 00	26 00			
Holmes	39	111 00	81 00	2	20 00	10 00			
Huron	37	113 00	66 00	19	21 00	21 00	4	16 00	16 00
Jackson									
Jefferson	40	117 00	95 00	100	106 00	102 00			
Knox	45	179 00	101 00	16	39 00	24 00	23	87 00	70 00
Lake	29	60 00	42 00	36	39 00	31 00			
Lawrence	12	47 00	12 00	15	56 00	20 00	10	51 00	25 00
Licking	32	184 00	175 00	27	132 00	132 00	9	50 00	50 00
Logan	83	384 00	220 00						
Lorain	36	60 00	55 00	48	63 00	57 00	29	103 00	95 00
Lucas	63	535 00	535 00	23	110 00	110 00	76	447 00	447 00
Madison									
Mahoning	48	93 00	68 00						
Marion	77	221 00	206 00	41	37 00	37 00	13	48 00	48 00
Medina	33			14			55	62 00	62 00
Meigs							6		
Mercer	10	63 00	31 00				1	29 00	5 00
Miami	91	256 00	143 00						
Monroe	10	54 00	44 00	3	37 00	25 00			
Montgomery									
Morgan	18	34 00	34 00	42	38 00	36 00	41	30 00	25 00
Morrow	90	169 00	167 00	12	17 00	14 00	36	85 00	85 00
Muskingum	39	206 00	115 00				38	97 00	75 00
Noble	10	46 00	40 00	6	27 00	27 00	15	330 00	330 00
Ottawa									
Paulding	18		46 00	7		23 00	10		16 00
Perry	28	103 00	20 00	18	32 00	16 00			
Pickaway									
Pike									
Portage	13	79 00	18 00	5	12 00	7 00	8	56 00	48 00
Preble	39	150 00	128 00	27	85 00	80 00	48	42 00	40 00
Putnam	48	110 00	106 00	13	42 00	12 00	17	54 00	44 00
Richland	70	100 00	95 00	61	100 00	96 00			

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Draft.		Light harness and saddle.		Sweepstakes.	
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Ross.....	53	\$195 00	\$172 00	42	\$137 00	\$85 00
Sandusky.....	26	.....	.....	13	.....	.....
Scioto.....	.....	.....	.....	.....	.....	.....
Seneca.....	26	144 00	86 00	.....	.....	.....
Shelby.....	44	100 00	84 00	.....	.....	.....
Stark.....	82	482 00	256 00	14	214 00	83 00
Summit.....	26	200 00	111 00	.....	.....	.....
Trumbull.....	31	81 00	53 00	.....	.....	.....
Tuscarawas.....	23	101 00	75 00	47	235 00	156 00
Union.....	161	77 00	71 00	7	8 00	8 00
Van Wert.....	45	78 00	55 00	.....	.....	.....
Vinton.....	.....	.....	.....	.....	.....	.....
Warren.....	35	180 00	153 00	10	21 00	21 00
Washington.....	19	91 00	49 00	.....	.....	.....
Wayne.....	.....	.....	.....	.....	.....	.....
Williams.....	34	96 00	64 00	.....	.....	.....
Wood.....	43	183 00	.....	.....	.....	.....
Wyandot.....	22	23 00	23 00	37	97 00	97 00
Totals.....	3,216	\$9,874 00	\$7,244 00	1,091	\$2,861 00	\$2,299 00
				958	\$3,301 00	\$3,032 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Speed.			Jacks and mules.			Shorthorns.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Adams									
Allen	30	\$710 00	\$572 00				50	\$98 00	\$86 00
Ashland									
Ashabula	24	430 00	400 00				18	58 00	50 00
Athens									
Auglaize	23	475 00	405 00	4	\$29 00	\$10 00	37	219 00	212 00
Belmont	24	565 00	565 00	1	30 00	2 00	26	145 00	74 00
Brown				7	36 00	18 00	18	51 00	49 00
Butler	34	1,250 00	1,230 00	21	54 00	54 00	24	124 00	117 00
Carroll	13	530 00	530 00	5	10 00	10 00	31	69 00	69 00
Champaign	23	323 00	295 00				39	81 00	81 00
Clarke	26	530 00	340 00	12	47 00	19 00	39	220 00	204 00
Clermont	26	210 00	210 00	34	70 00	58 00	24	95 00	86 00
Clinton	50	1,000 00	1,000 00	2	29 00	8 00	20	311 00	239 00
Columbiana	28	201 00	201 00				23	59 00	47 00
Coshocton	44	1,086 00	1,025 00	3	97 00	27 00	56	167 00	153 00
Crawford				2	35 00	6 00	25	82 00	49 00
Cuyahoga	26	450 00	360 00				35	38 00	33 00
Darke	20	1,850 00	1,119 00				44	388 00	234 00
Defance	20	1,050 00	435 00	2	45 00	13 00	34	108 00	108 00
Delaware	11	55 00	55 00	6	20 00	15 00	34	67 00	63 00
Erie									
Fairfield	100	2,550 00	2,550 00	3	80 00	20 00	21	172 00	162 00
Fayette									
Franklin									
Fulton	3	30 00	30 00				47	68 00	59 00
Gallia	12	295 00	295 00	4	32 00	7 00	30	114 00	101 00
Geauga	26	750 00	735 00				55	57 00	57 00
Greene	23	430 00	419 00	4	30 00	7 00	17	81 00	73 00
Huernsey	19	89 00	73 00	2	18 00	6 00	62	66 00	54 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Speed.			Jacks and mules.			Shorthorns.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Hamilton	33	\$995 00	\$655 00	5	\$18 00	\$18 00	24	\$94 00	\$87 00
Hancock .....	.....	825 00	825 00	2	79 00	8 00	28	79 00	75 00
Harbin	17	1,005 00	995 00	.....	.....	.....	33	106 00	72 00
Harrison .....	.....	.....	.....	6	8 00	6 00	37	114 00	86 00
Henry	40	.....	.....	.....	.....	.....	25	.....	.....
Highland	48	1,450 00	1,015 00	3	20 00	10 00	22	250 00	227 00
Hocking	5	25 00	25 00	2	34 00	4 00	7	76 00	44 00
Holmes .....	.....	.....	.....	4	20 00	11 00	58	169 00	157 00
Huron	32	558 00	388 00	.....	.....	.....	25	80 00	63 00
Jackson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	20	480 00	380 00	2	8 00	8 00	35	132 00	129 00
Knox	26	985 00	760 00	8	20 00	17 00	17	56 00	42 00
Lake	29	575 00	570 00	.....	.....	.....	81	142 00	123 00
Lawrence	2	30 00	15 00	2	26 00	4 00	.....	.....	.....
Licking .....	.....	1,775 00	1,775 00	5	37 00	23 00	39	196 00	196 00
Logan	16	685 00	550 00	8	39 00	22 00	19	114 00	94 00
Lorain .....	.....	.....	.....	.....	.....	.....	29	59 00	47 00
Lucas	113	4,000 00	4,000 00	.....	30 00	.....	69	160 00	160 00
Madison .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning	12	160 00	160 00	.....	.....	.....	48	101 00	94 00
Marion	22	1,125 00	1,125 00	13	25 00	19 00	20	111 00	105 00
Medina	21	.....	.....	.....	.....	.....	33	.....	.....
Melgs .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Merger	24	1,000 00	645 00	.....	.....	.....	14	111 00	37 00
Miami	41	860 00	740 00	2	51 00	5 00	3	60 00	15 00
Monroe	21	550 00	324 00	1	29 00	5 00	3	44 00	14 00
Montgomery .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan	19	565 00	520 00	16	35 00	23 00	13	54 00	37 00
Morrow	22	700 00	700 00	5	22 00	7 00	39	80 00	80 00
Muskingum	23	1,075 00	995 00	3	22 00	8 00	18	88 00	56 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Devons.			Herefords.			Holsteins.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Adams							12	\$64 00	\$35 00
Allen									
Ashland	6	\$56 00	\$27 00						
Ashtabula									
Athens									
Auglaize									
Belmont									
Brown		229 00	60 00						
Butler							26	75 00	70 00
Carroll									
Champaign		30 00							
Clarke	14	117 00	89 00						
Clermont									
Clinton									
Columbiana									
Coshocton	14	97 00	83 00				10	25 00	25 00
Crawford	5	82 00	14 00			\$82 00		82 00	
Cuyahoga							10	70 00	60 00
Darke	16	132 00	103 00						
Defiance		108 00		19	108 00	\$79 00	3	108 00	18 00
Delaware	11	59 00	35 00						
Erie									
Fairfield	6	130 00	28 00	3	128 00	35 00	3	128 00	35 00
Fayette									
Franklin									
Fulton				16	48 00	41 00	9	48 00	31 00
Gallia									
Geauga	12	51 00	31 00	13	51 00	29 00	4	51 00	11 00

Greene.....	17	87 00	74 00	3	67 00	15 00	.....	.....	.....
Guernsey.....	.....	29 00	.....	.....	.....	.....	.....	.....	.....
Hamilton.....	.....	94 00	.....	.....	.....	.....	17	94 00	62 00
Hancock.....	3	77 00	14 00	.....	.....	.....	8	77 00	40 00
Hardin.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harrison.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Henry.....	5	.....	.....	.....	.....	.....	5	.....	.....
Highland.....	.....	.....	.....	.....	.....	.....	8	80 00	20 00
Hocking.....	.....	.....	.....	.....	.....	.....	6	76 00	20 00
Holmes.....	.....	.....	.....	.....	.....	.....	5	67 00	24 00
Huron.....	19	80 00	54 00	28	80 00	62 00	28	80 00	77 00
Jackson.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson.....	.....	35 00	.....	.....	54 00	.....	12	35 00	29 00
Knox.....	1	56 00	6 00	8	48 00	38 00	2	56 00	9 00
Lake.....	.....	.....	.....	23	69 00	57 00	13	54 00	43 00
Lawrence.....	.....	.....	.....	.....	.....	.....	12	71 00	23 00
Licking.....	.....	.....	.....	.....	.....	.....	32	148 00	120 00
Logan.....	.....	.....	.....	.....	.....	.....	4	83 00	18 00
Lorain.....	4	59 00	10 00	37	59 00	52 00	6	59 00	22 00
Lucas.....	22	160 00	121 00	31	160 00	145 00	74	160 00	160 00
Madison.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning.....	.....	.....	.....	20	91 00	68 00	1	45 00	4 00
Marion.....	.....	111 00	.....	.....	111 00	.....	1	.....	5 00
Medina.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Meigs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mercer.....	.....	.....	.....	.....	42 00	.....	.....	42 00	.....
Miami.....	18	54 00	42 00	.....	.....	.....	5	44 00	13 00
Monroe.....	.....	44 00	.....	.....	.....	.....	.....	.....	.....
Montgomery.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan.....	10	45 00	22 00	.....	.....	.....	.....	.....	.....
Morrow.....	15	80 00	49 00	.....	.....	.....	.....	.....	.....
Muskingum.....	44	88 00	75 00	.....	.....	.....	.....	.....	.....
Noble.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paulding.....	.....	.....	.....	.....	.....	.....	12	.....	52 00
Perry.....	9	46 00	8 00	.....	.....	.....	.....	.....	.....
Pickaway.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pike.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portage.....	12	42 00	30 00	.....	.....	.....	16	42 00	27 00
Preble.....	1	60 00	8 00	7	80 00	45 00	17	102 00	84 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Devons.			Herefords.			Holsteins.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Putnam.....	.....	\$99 00	.....	.....	\$79 00	.....	2	\$79 00	\$11 00
Richland .....	.....	64 00	.....	.....	64 00	.....	.....	64 00	.....
Ross.....	.....	.....	.....	.....	.....	.....	17	.....	.....
Sandusky .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scioto .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seneca.....	1	70 00	\$6 00	.....	.....	.....	5	70 00	28 00
Shelby.....	11	78 00	45 00	.....	78 00	.....	1	78 00	10 00
Stark.....	.....	.....	.....	2	44 00	\$13 00	30	125 00	103 00
Summit.....	.....	111 00	.....	.....	.....	.....	.....	.....	.....
Trumbull	8	77 00	42 00	24	77 00	59 00	17	77 00	64 00
Tuscarawas.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union.....	.....	.....	.....	5	.....	.....	.....	.....	.....
Van Wert.....	.....	.....	.....	.....	.....	.....	17	39 00	35 00
Vinton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren.....	.....	36 00	.....	.....	40 00	.....	.....	40 00	.....
Washington.....	11	54 00	42 00	.....	.....	.....	3	52 00	14 00
Wayne.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Williams.....	.....	.....	.....	1	59 00	4 00	26	59 00	40 00
Wood.....	.....	.....	.....	.....	.....	.....	5	.....	.....
Wyandot.....	.....	.....	.....	.....	.....	.....	5	.....	.....
Totals	295	\$2,927 00	\$1,118 00.	240	\$1,719 00	\$742 00	490	\$2,749 00	\$1,442 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Jerseys.			Other beef breeds.			Breeds.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Hamilton	47	\$94 00	\$94 00	.....	.....	.....	.....	.....	.....
Hancock	16	77 00	59 00	22	\$85 00	\$59 00	24	\$56 00	\$56 00
Hardin	4	50 00	9 00	8	47 00	30 00	10	48 00	40 00
Harrison	2	8 00	6 00	29	66 00	50 00	.....	.....	.....
Henry	20	.....	.....	10	.....	.....	.....	.....	.....
Highland	8	80 00	45 00	.....	.....	.....	.....	.....	.....
Hocking	11	76 00	32 00	.....	.....	.....	.....	.....	.....
Holmes	6	67 00	27 00	.....	.....	.....	.....	.....	.....
Huron	24	80 00	41 00	17	49 00	36 00	28	64 00	43 00
Jackson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	16	42 00	37 00	9	68 00	14 00	1	49 00	8 00
Knox	13	56 00	46 00	2	34 00	5 00	.....	18 00	.....
Lake	34	92 00	78 00	5	23 00	17 00	.....	.....	.....
Lawrence	7	75 00	15 00	.....	.....	.....	.....	.....	.....
Licking .....	.....	.....	.....	37	63 00	40 00	12	68 00	19 00
Logan	21	83 00	66 00	21	126 00	68 00	16	145 00	128 00
Lorain	7	59 00	29 00	26	120 00	100 00	18	66 00	40 00
Lucas	35	320 00	249 00	58	260 00	260 00	41	102 00	69 00
Madison .....	.....	.....	.....	.....	.....	.....	58	260 00	260 00
Mahoning	8	45 00	17 00	62	156 00	120 00	.....	.....	.....
Marion	21	111 00	90 00	25	190 00	124 00	29	51 00	41 00
Medina	16	.....	.....	27	.....	.....	18	117 00	117 00
Meigs .....	.....	.....	.....	.....	.....	.....	14	.....	.....
Mercer .....	.....	42 00	.....	.....	.....	.....	.....	.....	.....
Miami .....	.....	.....	.....	23	211 00	114 00	.....	.....	.....
Monroe	5	44 00	16 00	6	58 00	20 00	8	22 00	20 00
Montgomery .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan	4	50 00	17 00	11	39 00	33 00	53	74 00	67 00
Morrow	40	80 00	76 00	37	150 00	123 00	6	20 00	20 00
Muskingum	9	88 00	42 00	1	12 00	8 00	3	65 00	10 00

Noble.....	5	79 00	18 00	2	34 00	12 00	4	49 00	10 00
Ottawa.....				16		37 00			
Paulding.....	2	44 00	2 00				10	50 00	12 00
Perry.....									
Pickaway.....									
Pike.....	19	42 00	39 00	76	164 00	177 00			
Portage.....	12	66 00	43 00	35	265 00	157 00	6	35 00	35 00
Preble.....	7	95 00	22 00	20	52 00	48 00	15	95 00	36 00
Putnam.....	15	64 00	51 00	4	37 00	15 00	15	56 00	56 00
Richland.....	19	124 00	103 00						
Ross.....	18			23					
Sandusky.....									
Scioto.....									
Seneca.....	20	70 00	65 00	24	51 00	52 00			
Shelby.....	26	78 00	76 00	12	45 00	31 00			
Stark.....	17	125 00	83 00	19	62 00	53 00	8	50 00	50 00
Summit.....				13	67 00	53 00			
Trumbull.....	17	77 00	48 00	89	146 00	119 00	22	16 00	16 00
Tuscarawas.....	6	40 00	37 00				25	233 00	59 00
Union.....	36	122 00	75 00						
Van Wert.....	3	32 00	4 00	14	38 00	37 00			
Vinton.....									
Warren.....				8	78 00	33 00	9	132 00	132 00
Washington.....	9	52 00	25 00	67	235 00	48 00	1	9 00	5 00
Wayne.....									
Williams.....	18	59 00	43 00	18	54 00	33 00			
Wood.....				5			17	130 00	
Wyandot.....		40 00						127 00	120 00
Totals.....	781	\$3,728 00	\$2,267 00	1,598	\$6,258 00	\$3,932 00	662	\$2,785 00	\$1,863 00

Greene	55	178 00	150 00	39	104 00	89 00	26	33 00	11 00
Guernsey	37	87 00	57 00	35	61 00	42 00	115	42 00	8 00
Hamilton	48	145 00	96 00	23	280 00	132 00	58	67 00	30 00
Hancock	53	118 00	108 00	55	98 00	53 00	53	70 00	53 00
Hardin	40	162 00	115 00	88	159 00	116 00	56	60 00	46 00
Harrison	358	210 00	140 00	45	89 00	67 00	57	40 00	30 00
Henry	30			40			60		
Highland	53	124 00	113 00	57	178 00	146 00	80	110 00	52 00
Hocking	10	154 00	47 00	19	414 00	60 00	30	99 00	30 00
Holmes	62	162 00	138 00	57	197 00	102 00	42	43 00	34 00
Huron	85	215 00	179 00	57	111 00	85 00	49	57 00	27 00
Jackson									
Jefferson	72	202 00	163 00	41	75 00	75 00	62	25 00	20 00
Knox	58	209 00	145 00	36	165 00	92 00	63	62 00	35 00
Lake	84	50 00	50 00	61	51 00	42 00	69	57 00	33 00
Lawrence	18	50 00	25 00	24	87 00	43 00	27	27 00	11 00
Licking	105	480 00	456 00	105	546 00	540 00	191	335 00	335 00
Logan	53	117 00	582 00	59	270 00	131 00	103	126 00	50 00
Loran	81	121 00	115 00	23	126 00	66 00	147	79 00	57 00
Lucas	97	415 00	411 00	116	742 00	729 00	384	428 00	416 00
Madison									
Mahoning	63	181 00	124 00	49	151 00	119 00	201	86 00	68 00
Marion	103	251 00	224 00	91	252 00	131 00	93	67 00	54 00
Medina	86			55			125		
Meigs									
Mercer	13	82 00	28 00	28	142 00	47 00	48	76 00	33 00
Miami	90	210 00	207 00	60	191 00	128 00	35	59 00	36 00
Monroe	27	147 00	98 00	7	164 00	25 00	55	111 00	45 00
Montgomery									
Morgan	79	160 00	129 00	69	73 00	73 00	75	40 00	37 00
Morrow	81	135 00	117 00	116	159 00	143 00	93	160 00	35 00
Muskingum	49	273 00	162 00	40	228 00	167 00	111	102 00	77 00
Noble	16	120 00	64 00	8	30 00	24 00	9	9 00	7 00
Ottawa									
Paulding	23		41 00	23		44 00	9	19 00	9 00
Perry	18	95 00	20 00	23	90 00	16 00	41	35 00	12 00
Pickaway									
Pike									
Portage	81	170 00	134 00	25	70 00	44 00	118	38 00	30 00
Preble	118	202 00	175 00	122	275 00	250 00	174	85 00	75 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Sheep.			Swine.			Poultry.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Putnam.....	43	\$76 00	\$76 00	43	\$88 00	\$75 00	106	\$59 00	\$49 00
Richland	77	177 00	154 00	103	175 00	175 00	117	102 00	92 00
Ross	28	127 00	111 00	21	162 00	81 00	25	102 00	25 00
Sandusky	125	.....	.....	60	.....	.....	215	.....	.....
Scioto	66	99 00	91 00	57	132 00	112 00	97	75 00	41 00
Seneca	64	117 00	114 00	80	128 00	121 00	137	84 00	84 00
Shelby	130	512 00	435 00	76	354 00	294 00	137	123 00	70 00
Stark	82	312 00	242 00	29	113 00	71 00	169	130 00	80 00
Summit.....	127	133 00	114 00	39	110 00	81 00	118	53 00	21 00
Trumbull.....	33	144 00	86 00	75	178 00	161 00	37	56 00	21 00
Tuscarawas.....	129	257 00	257 00	85	262 00	255 00	132	66 00	54 00
Union.....	58	110 00	70 00	33	160 00	82 00	49	72 00	46 00
Van Wert.....	37	167 00	82 00	57	259 00	196 00	184	103 00	75 00
Vinton.....	14	142 00	30 00	15	123 00	32 00	21	53 00	10 00
Warren.....	97	147 00	104 00	46	96 00	35 00	40	21 00	11 00
Washington.....	40	79 00	.....	31	100 00	.....	120	31 00	.....
Wayne	25	187 00	150 00	23	107 00	95 00	30	43 00	31 00
Williams .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wood .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wyandot .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	4,897	\$12,038 00	\$9,607 00	3,858	\$11,735 00	\$8,249 00	6,663	\$5,427 00	\$3,509 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Farm products.			Fruits.			Flowers.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Hamilton	211	\$106 00	\$103 00	88	\$94 00	\$74 00	21	\$83 00	\$60 00
Hancock	1,107	272 00	248 00	47	27 00	18 00	22	18 00	16 00
Hardin	369	122 00	81 00	28	15 00	4 00	24	40 00	24 00
Harrison	712	100 00	80 00	220	53 00	40 00	90	20 00	15 00
Henry	400	.....	.....	100	.....	.....	80	.....	.....
Highland	114	80 00	71 00	19	20 00	18 00	52	72 00	65 00
Hocking	69	125 00	19 00	.....	.....	.....	3	35 00	2 00
Holmes	323	113 00	97 00	153	41 00	27 00	41	22 00	29 00
Huron	440	155 00	89 00	128	47 00	40 00	27	19 00	19 00
Jackson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	965	145 00	141 00	196	25 00	21 00	70	31 00	17 00
Knox	56	115 00	28 00	42	61 00	19 00	.....	.....	.....
Lake	374	98 00	60 00	153	38 00	25 00	.....	.....	.....
Lawrence	550	180 00	33 00	320	386 00	34 00	22	10 00	4 00
Licking	992	531 00	490 00	233	120 00	90 00	44	44 00	43 00
Logan	1,110	250 00	277 00	70	49 00	34 00	243	57 00	115 00
Lorain	278	151 00	116 00	130	69 00	55 00	26	23 00	22 00
Lucas	1,226	1,237 00	1,231 00	63	347 00	347 00	29	369 00	369 00
Madison .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning	610	240 00	139 00	302	41 00	36 00	179	107 00	93 00
Marion	515	267 00	134 00	79	18 00	15 00	22	34 00	28 00
Medina	435	.....	.....	60	.....	.....	33	.....	.....
Meigs .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mercer	158	119 00	51 00	3	12 00	2 00	43	23 00	15 00
Miami	401	267 00	219 00	80	82 00	58 00	9	72 00	57 00
Monroe	160	55 00	11 00	67	15 00	8 00	260	36 00	35 00
Montgomery .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan	279	96 00	72 00	72	26 00	26 00	19	20 00	19 00
Morrow	810	122 00	110 00	150	110 00	65 00	70	25 00	21 00
Muskingum	328	99 00	76 00	428	213 00	175 00	27	59 00	54 00

	17	64 00	9 00	7	18 00	9 00	1	10 00	1 00
Noble .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa .....	.....	.....	90 00	.....	.....	58 00	.....	.....	.....
Paulding .....	.....	.....	33 00	40	50 00	10 00	46	40 00	12 00
Perry	89	90 00	.....	.....	.....	.....	.....	.....	.....
Pickaway .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pike .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portage	598	173 00	101 00	376	61 00	45 00	51	67 00	30 00
Preble	916	200 00	235 00	93	23 00	27 00	170	60 00	70 00
Putnam	261	124 00	47 00	260	65 00	50 00	9	10 00	8 00
Richland	73	120 00	112 00	56	43 00	43 00	15	34 00	27 00
Ross	130	172 00	139 00	189	152 00	102 00	29	61 00	44 00
Sandusky	413	.....	.....	163	.....	.....	117	.....	.....
Scioto .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seneca	663	200 00	162 00	176	62 00	49 00	.....	91 00	79 00
Shelby	721	131 00	125 00	45	48 00	30 00	92	27 00	22 00
Stark	1,263	40 00	370 00	900	168 00	141 00	86	97 00	70 00
Summit	398	282 00	212 00	246	80 00	78 00	76	215 00	215 00
Trumbull	543	161 00	129 00	255	57 00	31 00	96	57 00	44 00
Tuscarawas	709	147 00	174 00	172	35 00	31 00	99	38 00	27 00
Union	474	236 00	157 00	19	25 00	19 00	54	132 00	32 00
Van Wert	440	73 00	65 00	54	20 00	26 00	132	15 00	12 00
Vinton .....	.....	.....	.....	.....	.....	.....	25	.....	.....
Warren	754	194 00	175 00	251	95 00	86 00	.....	81 00	77 00
Washington	122	120 00	25 00	123	31 00	14 00	34	30 00	.....
Wayne .....	.....	.....	.....	.....	.....	.....	18	.....	.....
Williams	377	100 00	56 00	201	52 00	34 00	.....	20 00	17 00
Wood	1,110	146 00	.....	283	65 00	.....	82	47 00	.....
Wyandot	450	150 00	105 00	75	29 00	22 00	134	35 00	15 00
Totals	34,756	\$12,299 00	\$9,571 00	11,252	\$4,726 00	\$3,140 00	5,942	\$3,919 00	\$3,234 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Machinery and manufacturing products.		Fine arts.			Textile fabrics and domestic manufactures.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount awarded.
Adams	138	\$101 00	\$69 00	80	\$25 00	\$27 00	274	74 00
Allen	47	68 00	12 00	137	63 00	63 00	441	137 00
Ashland	67		77 00	2	5 00	5 00	184	93 00
Ashtabula	40	231 00	31 00	38	54 00	10 00	57	126 00
Athens	64	96 00	92 00	22	8 00	7 00	118	81 00
Auglaize	76	119 00	74 00	117	57 00	54 00	974	353 00
Belmont	52	82 00	53 00	30	27 00	27 00	277	95 00
Brown	110			67	12 00	10 00	303	94 00
Butler	109	181 00	101 00	64	54 00	31 00	182	93 00
Carroll	60	171 00	87 00	67	51 00	46 00	269	88 00
Champaign	35	124 00	75 00	11	21 00	14 00	155	91 00
Clermont	72	155 00	154 00	18	20 00	17 00	156	89 00
Columbiana	113	203 00	136 00	35	75 00	53 00	163	85 00
Coshocton	19	103 00	15 00	261	100 00	39 00	322	190 00
Crawford	119	105 00	67 00	46	36 00	20 00	206	76 00
Cuyahoga	157	234 00	171 00	66	84 00	39 00	319	28 00
Darke	105			74	49 00	18 00	314	258 00
Defiance	140	227 00	186 00	49	138 00	54 00	363	164 00
Delaware	23	79 00	60 00	375	806 00	707 00	211	707 00
Erie								660 00
Fairfield								
Fayette								
Franklin	29	94 00	18 00	43	49 00	31 00	267	106 00
Fulton	64	64 00	34 00	6	16 00	6 00	119	69 00
Gallia	42	44 00	39 00	90	40 00	27 00	274	93 00
Geauga								54 00

Greene.....	64	53 00	50 00	465	104 00	98 00
Gurnsey.....	23	27 00	7 00	640	110 00	41 00
Hamlin.....	119	80 00	66 00	63	88 00	81 00
Hancock.....	43	16 00	16 00	337	127 00	74 00
Hardin.....	12	14 00	12 00	126	94 00	44 00
Harrison.....	150	40 00	30 00	546	112 00	84 00
Henry.....	100	.....	.....	312	.....	.....
Highland.....	12	25 00	23 00	76	56 00	51 00
Hocking.....	.....	.....	.....	12	143 00	11 00
Holmes.....	31	20 00	15 00	207	75 00	65 00
Huron.....	88	54 00	43 00	388	196 00	115 00
Jackson.....	.....	.....	.....	.....	.....	.....
Jefferson.....	15	15 00	5 00	351	85 00	77 00
Knox.....	.....	.....	.....	74	289 00	100 00
Lake.....	57	24 00	18 00	205	66 00	47 00
Lawrence.....	8	6 00	2 00	78	50 00	16 00
Licking.....	159	183 00	183 00	517	307 00	307 00
Logan.....	153	75 00	92 00	716	200 00	246 00
Loran.....	89	42 00	22 00	218	126 00	85 00
Lucas.....	432	290 00	290 00	569	273 00	273 00
Madison.....	.....	.....	.....	.....	.....	.....
Mahoning.....	110	121 00	96 00	177	79 00	50 00
Marion.....	100	95 00	57 00	402	423 00	336 00
Medina.....	80	.....	.....	273	.....	.....
Meigs.....	.....	.....	.....	.....	.....	.....
Mercer.....	2	29 00	2 00	106	194 00	65 00
Miami.....	53	78 00	49 00	360	226 00	160 00
Monroe.....	11	8 00	4 00	160	42 00	8 00
Montgomery.....	.....	.....	.....	.....	.....	.....
Morgan.....	93	65 00	43 00	241	96 00	69 00
Morrow.....	80	15 00	50 00	475	165 00	116 00
Muskingum.....	49	50 00	66 00	152	109 00	79 00
Noble.....	.....	36 00	8 00	16	.....	.....
Ottawa.....	.....	.....	.....	.....	.....	.....
Paulding.....	.....	.....	.....	.....	.....	.....
Perry.....	20	30 00	10 00	82	90 00	43 00
Pickaway.....	.....	.....	.....	.....	.....	.....
Pike.....	.....	.....	.....	.....	.....	.....
Portage.....	69	34 00	29 00	217	71 00	42 00
Preble.....	150	32 00	40 00	410	90 00	130 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Machinery and manufacturing products.			Fine arts.			Textile fabrics and domestic manufactures.		
	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.	No. of entries.	Amount offered.	Amount awarded.
Putnam.....	43	\$122 00	\$72 00	46	\$32 00	\$30 00	309	\$173 00	\$152 00
Richland.....	.....	.....	.....	68	70 00	50 00	126	122 00	102 00
Rosa.....	39	166 00	138 00	35	90 00	36 00	258	388 00	276 00
Sandusky.....	373	.....	.....	67	.....	.....	371	.....	.....
Scioto.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seneca.....	.....	.....	.....	184	75 00	38 00	424	176 00	88 00
Shelby.....	102	117 00	59 00	84	67 00	46 00	286	173 00	95 00
Stark.....	500	55 00	39 00	169	262 00	215 00	343	413 00	326 00
Summit.....	61	185 00	135 00	109	150 00	150 00	212	103 00	85 00
Trumbull.....	74	168 00	82 00	76	82 00	55 00	203	100 00	92 00
Tu-carawas.....	42	123 00	37 00	115	63 00	60 00	530	248 00	181 00
Union.....	135	150 00	124 00	88	50 00	48 00	255	214 00	178 00
Van Wert.....	33	62 00	29 00	37	24 00	13 00	194	94 00	70 00
Vinton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren.....	127	314 00	233 00	57	101 00	84 00	391	120 00	93 00
Washington.....	38	172 00	48 00	12	39 00	23 00	58	251 00	.....
Wayne.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Williams.....	120	.....	.....	74	37 00	33 00	95	115 00	60 00
Wood.....	95	.....	.....	30	34 00	.....	275	108 00	.....
Wyandot.....	25	13 00	8 00	32	39 00	29 00	250	146 00	.....
Totals.....	6246	\$7,557 00	\$4,429 00	5,253	\$4,623 00	\$3,533 00	19,969	\$9,239 00	\$7,349 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Non-enumerated.		
	No. of entries.	Amount offered.	Amount awarded.
Adams			
Allen	39	\$10 00	\$13 00
Ashland			
Ashtabula	135	360 00	346 00
Athens			
Auglaize			
Belmont	11		
Brown	276		34 00
Butler			
Carroll	310		
Champaign	16	16 00	16 00
Clarke	55		
Clermont	89	84 00	81 00
Clinton	145		
Columbiana	200		170 00
Coshocton	276		106 00
Crawford	38	66 00	34 00
Cuyahoga	76	20 00	20 00
Darke	37	140 00	85 00
Defiance	49	51 00	31 00
Delaware	6	154 00	100 00
Erie			
Fairfield			
Fayette			
Franklin			
Fulton	74	82 00	26 00
Gallia	50	42 00	54 00
Geauga	76	43 00	25 00
Greene			
Guernsey			
Hamilton	146		82 00
Hancock	175	100 00	100 00
Hardin	108		9 00
Harrison			
Henry	40		
Highland	16	36 00	30 00
Hocking			
Holmes	142	47 00	47 00
Huron	10	16 00	8 00
Jackson			
Jefferson	115		20 00
Knox			
Lake			
Lawrence	15	58 00	34 00
Licking			
Logan	43		14 00
Lorain	111		
Lucas	112	84 00	84 00
Madison			
Mahoning	211	50 00	50 00
Marion	175		13 00
Medina			
Meigs			
Mercer	17		7 00
Miami	20	25 00	25 00

ENTRIES, AWARDS, ETC.—Continued.

Counties.	Non-enumerated.		
	No. of entries.	Amount offered.	Amount awarded.
Monroe	130	.....	14 00
Montgomery .....	.....	.....	.....
Morgan	20	25 00	21 00
Morrow	150	.....	92 00
Muskingum	38	98 00	42 00
Noble	24	13 00	13 00
Ottawa .....	.....	.....	.....
Paulding .....	.....	.....	9 00
Perry	5	30 00	4 00
Pickaway .....	.....	.....	.....
Pike .....	.....	.....	.....
Portage	51	40 00	21 00
Preble	140	220 00	170 00
Putnam	35	32 00	28 00
Richland .....	.....	.....	.....
Ross .....	.....	.....	.....
Sandusky	265	.....	.....
Scioto .....	.....	.....	.....
Seneca .....	.....	.....	.....
Shelby .....	.....	104 00	.....
Stark	317	185 00	384 00
Summit .....	.....	.....	.....
Trumbull .....	.....	52 00	52 00
Tuscarawas	22	.....	17 00
Union	86	93 00	54 00
Van Wert	31	13 00	7 00
Vinton .....	.....	.....	.....
Warren	84	143 00	133 00
Washington	55	5 00	.....
Wayne .....	.....	.....	.....
Williams .....	.....	.....	.....
Wood	125	.....	.....
Wyandot	64	286 00	.....
Totals	4,946	\$2,823 00	\$2,302 00

FINANCIAL EXHIBIT OF COUNTY SOCIETIES FOR 1885.

Counties.	Amount received from gate and entrance fees.	Amount received from booth rents, permits, etc.	Amount received from all other sources.	Amount paid in premi- ums.	Amount paid for real estate, buildings, and permanent improve- ments.	Amount paid for cur- rent expenses other than premiums.	Amount remaining in the treasury.	Total amount of indebt- edness, if any, over and above cash on hand.
Adams	\$1,936 15	\$696 89	\$1,882 04	\$1,627 50	\$2,037 43	\$556 27	.....	\$20 00
Allen	2,745 44	300 00	371 39	2,100 20	226 15	871 43	184 50	.....
Ashtabula	3,064 70	989 00	.....	1,344 49	2,020 89	1,185 62	338 11	.....
Athens	1,699 45	280 60	400 00	1,331 50	103 22	993 25	.....	1,389 25
Auglaize	1,894 70	329 90	157 60	1,348 25	210 90	1,211 10	40 24	.....
Belmont	6,603 55	2,719 55	2,804 00	4,356 00	3,392 07	5,029 13	.....	1,433 17
Brown	2,853 78	3,025 50	2,270 00	1,847 50	1,900 00	667 86	.....	.....
Butler	1,386 79	215 50	88 25	1,159 90	500 00	479 75	.....	.....
Carroll	2,669 65	697 10	902 50	2,164 83	.....	1,060 12	599 71	.....
Champaign	1,800 50	395 00	115 25	1,793 00	763 34	442 21	278 39	.....
Clarke	2,389 20	672 59	333 75	2,223 75	.....	999 53	172 26	.....
Clermont	2,780 38	323 00	472 50	1,503 85	1,674 07	1,293 85	481 65	.....
Columbiana	3,681 25	650 00	430 00	2,898 00	650 00	1,155 00	.....	1,500 00
Coshocton	2,332 95	501 00	271 00	1,874 68	500 00	1,178 71	.....	60 25
Crawford	986 55	198 85	29 40	916 40	82 12	359 95	414 91	1,273 65
Cuyahoga	5,280 00	2,355 15	2,210 25	3,003 61	2,143 05	4,008 43	449 74	.....
Darke	1,323 95	579 20	1,360 95	798 65	255 83	2,193 04	.....	12 44
Defiance	2,535 60	731 66	6,365 90	2,111 00	598 73	1,118 90	44 11	.....
Delaware	4,226 80	914 00	580 35	2,878 00	529 79	1,254 65	.....	2,090 52
Erie	7,922 45	2,310 20	739 59	5,993 00	.....	5,022 00	566 39	1,500 00
Fairfield .....	.....	.....	.....	.....	.....	.....	.....	.....
Fayette .....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin .....	.....	.....	2,216 55	.....	.....	751 57	1,464 98	.....

FINANCIAL EXHIBIT OF COUNTY SOCIETIES FOR 1885—Continued.

Counties.	Amount received from gate and entrance fees.	Amount received from booth rents, permits, etc.	Amount received from all other sources.	Amount paid in premi- ums.	Amount paid for real estate, buildings, and permanent improve- ments.	Amount paid for cur- rent expenses other than premiums.	Amount remaining in the treasury.	Total amount of indebt- edness, if any, over and above cash on hand.
Fulton	\$1,117 25	\$160 50	\$53 00	\$92 05	\$25 00	\$519 94	\$7 06	\$19 68
Gallia	1,008 53	112 50	301 68	964 00	198 39	280 00	.....	.....
Geauga	3,177 30	520 23	209 11	1,882 50	1,074 79	814 64	828 85	.....
Greene .....	.....	.....	.....	.....	.....	.....	.....	.....
Guernsey	841 90	41 25	24 00	598 00	108 73	247 74	406 00	.....
Hamilton	3,378 27	1,435 73	1,630 54	2,409 10	2,847 74	.....	92 00	.....
Hancock .....	.....	.....	4,554 52	4,610 77	328 37	.....	.....	.....
Hardin	1,714 00	577 00	648 00	2,020 00	543 00	564 00	.....	1,800 00
Harrison	1,716 68	150 00	341 08	1,125 33	1,050 77	.....	31 66	4,456 00
Henry	2,688 00	603 00	2,500 00	1,267 00	2,500 00	1,500 00	533 00	.....
Highland	2,337 00	436 00	378 00	2,151 00	351 00	1,164 00	.....	4,167 00
Hocking	369 58	61 50	55 80	487 75	.....	295 73	.....	515 00
Holmes	1,951 67	354 00	546 91	1,696 90	715 21	921 60	.....	481 13
Huron	2,046 60	810 10	1,077 15	1,639 25	975 00	2,092 94	76 66	.....
Jackson .....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	1,518 98	150 00	380 09	1,480 31	204 00	396 10	.....	71 34
Knox	3,256 70	294 00	2,646 08	1,446 00	2,000 00	2,750 76	117 92	6,000 00
Lake	2,459 75	240 25	167 01	1,539 80	500 00	732 95	94 26	.....
Lawrence	548 49	3 50	227 75	390 74	.....	394 68	5 68	.....
Licking	4,951 24	1,576 25	2,112 83	4,559 70	1,109 19	1,182 99	.....	3,400 00
Logan	3,607 19	1,589 25	290 17	2,594 25	567 53	1,407 77	41 86	1,500 00
Lorain	3,433 66	338 56	690 51	1,728 12	1,691 12	1,217 35	37 94	.....
Lucas .....	.....	.....	.....	.....	.....	.....	.....	.....
Madison .....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning	2,133 25	225 00	400 00	1,835 00	486 62	750 65	4 93	173 00

Marion	3,550 44	601 00	940 80	3,375 00	1,061 04	1,253 35	63 36	800 00
Medina			2,803 00	1,400 00	600 00		800 00	
Meigs								688 48
Mercer	720 00	505 33	475 00	1,411 00	704 88	662 48		
Miami	2,684 00	363 25	911 63	2,327 00	866 13	696 53	427 33	
Monroe	983 35	103 95	448 79	783 30		752 27	52 00	
Montgomery								
Morgan	1,591 31	188 40	573 14	1,511 00	240 18	607 07	47 91	1,200 00
Morrow	3,113 85	453 00	346 52	2,386 00	300 00	1,401 70		1,588 00
Muskingum	2,908 95	378 25	1,411 75	1,717 69	110 91	2,501 84	368 51	
Noble	628 30	98 00	211 38	713 75	113 97	110 30		59 09
Ottawa	620 15			419 36	324 01		3 88	
Paulding	1,039 95	254 77	247 79	792 55	477 75	280 65		150 00
Perry	840 20	397 95	207 18	573 37		675 78		1,669 00
Pickaway								
Pike								
Portage	2,634 30	267 41	674 70	1,587 60	962 50	916 32	109 99	1,942 76
Preble	3,913 50	1,523 00	554 39	2,938 00	760 00	2,036 26	255 63	
Putnam	1,894 20	683 34	1,423 38	1,774 27	531 21	775 39	920 05	1,731 95
Richland	3,661 88	353 30	872 31	2,160 45		2,371 24	1,699 34	
Ross	5,691 80	986 50	400 00	4,121 00		2,316 11	80 31	
Sandusky	2,905 84	561 00	2,106 00	1,475 00	1,529 91	1,991 84	576 31	500 00
Scioto								
Seneca	2,648 92	602 30	417 45	1,757 25		1,705 08	6 34	1,715 25
Shelby	2,867 40	568 77	312 11	1,734 45	605 23	970 04	438 56	
Stark	5,587 00	774 00	3,163 00	3,456 00	2,717 00	2,851 00		394 00
Summit	5,522 73	1,410 35	2,634 86	3,901 27	1,011 81	4,174 73	764 07	
Trumbull	2,135 90	195 00	166 79	1,600 50		893 65		3,000 00
Tuscarawas	2,218 45	295 00	543 42	1,301 20	359 41	1,389 69	6 57	972 32
Union	3,447 50	1,479 10	320 40	2,855 50	856 80	1,157 36	337 34	1,300 00
Van Wert	1,394 88	102 00	663 30	1,073 50	378 36	522 66	35 66	2,250 00
Vinton								
Warren	4,334 50	1,050 70	669 30	2,719 00		3,491 21		4,435 71
Washington	1,451 20	98 00	1,042 94	1,084 50	538 65	975 20		6 21
Wayne								
Williams	1,646 00	134 75	91 00	710 25		1,151 52		501 00
Wood	1,049 00	249 36	1,448 99	1,625 85		1,120 88		8 62
Wyandot	2,363 28	409 50	1,344 59	1,729 00	1,054 63	650 00	683 74	
Totals	\$179,420 66	\$40,919 74	\$71,658 35	\$136,797 29	\$50,057 48	\$90,179 44	\$14,988 71	\$56,727 81

COUNTY SOCIETIES.

ALLEN COUNTY.

The twenty-third Annual Fair of the Allen County Agricultural Society was held on the Society grounds at Lima, September 22d to 25th. The first day was taken up making entries and arranging the exhibits. The display in the departments were above the average. The display of horses, cattle, sheep, hogs, and especially poultry, was very fine. Our farmers are making great improvements in breeding fine stock of all kinds, all of which is largely due to our County Fairs. The Society made some very good improvements the past year on their grounds, all of which improvements were paid from the receipts of the Fair, after paying the premiums.

The wheat crop this year was above the average, the yield large, and the grain of first quality. Corn, which was up to the average in bushels, was not up to the average in quality. The oat crop was good. Hay, average yield, and secured in the best of condition. Fruits—apples, pears and cherries, almost an entire failure, and small fruits not an average crop. The county is now booming with the prospect of finding petroleum in paying quantities, several wells have been drilled and more are being drilled in different parts of the county. The citizens' well in Lima has been averaging fifty barrels per day for several days, with no signs of decrease. Geologists had told us there were no deposits of coal or oil in this part of the State. But an experienced oil man recently remarked that the point of a drill could tell more what was in the earth than the most scientific geologist.

ASHTABULA COUNTY.

The thirty-ninth Annual Fair of the Ashtabula County Agricultural Society was held on its grounds, at Jefferson, on the 22d, 23d, 24th and 25th of September, 1885.

While the Fairs of this Society have improved from year to year for a number of years, the last Fair was by far the best ever held; the exhibition was fine in all departments, and in each was superior of its kind.

The attendance was the largest ever before upon the grounds at a Fair.

Ashtabula county is a county where mixed farming is carried on.

Potatoes are grown to a large extent and are usually of a fine quality, but this year are rotting badly. Wheat, corn and oats are raised extensively.

The stock of cattle has been greatly improved, both the milk and beef breeds.

The horses of the county have also been greatly improved by breeding in all the different classes.

The dairy interests are also in a prosperous condition, with the exception of

the low price received for dairy products, in consequence of the enormous amount of bogus butter and cheese thrown upon the market, and sold to the consumer as a genuine article.

The condition of society socially, morally and intellectually is of the best, and compares favorably with any other portion of the State.

ATHENS COUNTY.

Our annual county fair was held on the Society's grounds, October 3, 4 and 5. On account of rain, the third day, the attendance was not as large as in former years; however the receipts were sufficient to pay the premiums and other expenses, and leave a little money in the treasury.

The display of horses was unusually good. Our people are giving more attention to the breeding of good horses than they have in the past. The cattlemen were out with a full display. Shorthorn, Holstein, and Jerseys are the breeds principally raised. The display of sheep was excellent. Athens county is a wool-growing county, and has about as good a stock of fine-wool sheep as any county in the State. We had a good display of swine, Poland-China, Chester-White, Berkshire, Yorkshire, and Essex were the breeds on exhibition.

The condition of agriculture is hardly up to the average. Our wheat crop was almost an entire failure, averaging not more than two bushels per acre. Most of the farmers had to buy their seed. I know of more than 3,000 bushels having been brought from Michigan and sowed in this county. I think there is an increase of ten per cent. in the acreage sown this fall, and the condition is fully up to an average. We had a large corn crop and it was harvested in good condition. The oat crop was extra heavy, and the acreage was greater than usual.

Our hay crop was a failure, not more than half the usual amount cut last harvest, yet, with the large crop of fodder and fodder corn, we will be able to get through the winter with what little stock we have.

Stock was sold off very close last fall. All kinds of stock have gone into winter-quarters in good condition.

The potato crop was a partial failure, though I think there will be enough for home consumption. We had about a half a crop of fruit. Poultry raising is an important item with our farmers. It is thought that the sale of poultry and eggs brings in more money than the sale of horses and cattle combined.

The farmers of this county are feeling rather poor this winter, having to buy our wheat, and sell our stock at low prices, make money scarce with all of us.

We have a home market for all our farm products. A large part of our people are engaged in mining and manufacturing; also the South-eastern Insane Asylum is situated at Athens, so we have a large class of consumers that are not producers.

AUGLAIZE COUNTY.

The twenty-second Annual Fair of the Auglaize County Agricultural Society was held on their grounds, near Wapakoneta, on September 29, 30, October 1 and 2, 1885.

The weather was fine, the attendance large, and the receipts were in excess of any former exhibition.

The receipts were sufficient to pay indebtedness, current expenses, premiums and new improvements, with several hundred dollars in the treasury.

One of the principal improvements is an elegant grandstand, 144x35 ft., built at a cost of \$2,000, besides stalls, wells and various other minor improvements.

The display in all departments was excellent, having plenty of room and ample accommodation.

We had the largest and finest exhibition of horses ever shown in the county.

The exhibition of cattle was very good.

The exhibition of sheep and swine was good, and an admirable exhibition of poultry.

The introduction of thoroughbred stallions has been of almost unlimited value to the county. Some of the finest bred stallions in the State are owned here.

We can not speak too highly of the success of several breeders of cattle and swine, who have very greatly raised the standard within the last four or five years, and are now gathering in the harvest of their investment and labor. Great credit is due them, and too much in terms of praise cannot be said.

The prosperity of our farmers shows very plainly in the appearance of their farms, the numerous splendid dwelling houses and barns, which have been and are being built, and good brick school-houses are found in nearly every school district.

The practical knowledge gained at our fairs is highly appreciated, and a rapid improvement in the agricultural interests is anticipated. Our prospects for the future we think to be as good as they have been for years, and with a body of energetic officers, good management on their part, and the regular annual increase in patronage will be, as it has been, a success in every respect.

BELMONT COUNTY.

The thirty seventh Fair, as is usual with the Fairs of the Belmont County Agricultural Society, had its special feature in the show of the stock, which, while not being overly full in any department, yet showed well in every different class. The Fair was held in the first week in September, and although threatening rain, Providence favored us with good weather. Our premium list was a long one, and paid in full. The stock parade on the second day was a pleasing and interesting feature, embracing thorough-bred horses, by Dr. J. Estep, Shorthorns from the herds of W. L. George, S. Hanna & Son and E. L. Carrick; Jerseys from the herds of L. P. Bailey, J. C. Hoge and J. H. Denham, and pure bred sheep from the flocks of Thomas Lodge, G. W. Rincker, Oliver Watkins and others.

STOCK.

There were entries in all the stock departments. Horses—draft, all purpose and saddle and light horses—there was a big show. Cattle—in all the different kinds, but an almost entire absence of grades. Sheep—a show in all classes, and as fine animals as live and flourish in any part of the famous wool growing State of Ohio. Swine—there were both black and white breeds, and some of size almost incredible. A large number of the different animals at our Fair took first premiums the following week at the West Virginia State

Fair and Exposition at Wheeling, which would go to show that Belmont county stock is appreciated away from home as well as at our own County Fairs.

POULTRY.

From the show of poultry, a stranger would be led to believe that our farmers had gone out of that business; but there are a large number of fanciers in all parts of the country who grow poultry for profit. The different breeds have their champions, of course, but the Wyandots are fast taking the leading place for "an all purpose" chicken, if we may be allowed such an expression in connection with poultry.

VEGETABLES AND GRAIN.

The almost entire failure of the wheat crop has been so thoroughly discussed that it is not worth while to say more than that Belmont county suffered the experience of the whole southern part of the State. Corn was a great crop, producing well on a large acreage planted, and being gathered in good condition. Stories of big crops and large individual ears are very common in this locality. Oats was an immense crop, and hay very good in quality, and a moderate crop in quantity. Tobacco, which is grown in parts of the county, was an extra heavy crop, was gathered in fine condition and brought a good price. Potatoes were reported a big crop in localities and a failure in other, and mostly were not up to the usual standard in quality. Vegetables, proper, were a good, fair crop, and brought usual prices in market.

FRUIT.

Apples was a fair crop of good, marketable fruit, but it was reported early in the winter that they were not keeping well. There was a fair local demand for the fruit at \$1 to 1.50 per barrel; and a large amount of cider was manufactured. Pears and grapes were an unusual crop, trees and vines being very full of fine and luscious fruit, while a home-grown peach was almost a novelty. Most of the peach trees were winter killed, many failing to show even a green leaf in the spring, much less a pink flower. Plums, of the damson variety, were very scarce, but other varieties produced well. Our great country strawberry crop has become a by-word almost all over the country. We have a reputation which goes beyond the State limits for the "Barnesville berry." Raspberries were a big crop, while blackberries failed with us. Currants and gooseberries seem to be one of the past industries in this vicinity, as we seldom even see them any more.

TIMBER.

The fact that the timber is fast disappearing, and that there is need to cultivate instead of cut it, seems not yet to have dawned upon the farmers' minds. Yes, we mistake, it has come to them in many ways, but they have not yet heeded the warning, but we feel that they will at no great future date. Groves are now growing few and far between, and besides the many other detrimental causes occasioned by this, we can mention that many of the beautiful springs of our memory are now things of the past, and where, as a boy, we caught "chubs" with pin-hook and cord line, now is only a suspicion of a stream, deserted alike by the minnows and cattle, who were wont there to drink.

FARMERS' INSTITUTE.

Under the auspices of the Belmont County Farmers' Club and the State Board of Agriculture, the fifth annual Farmers' Institute was held at St. Clairsville, on December 31, and January 1 and 2. The weather was all that could be desired for the season, and the immense outpourings of the people at each session, showed that our farming community is desirous of gaining all the knowledge they can, in regard to their different avocations and pursuits. Secretary W. I. Chamberlain addressed the Institute on two occasions, and received his usual warm welcome from our people, who have begun to look upon him and his addresses as a part of the Institutes, and a necessary and enjoyable one. The addresses of Prof. Lazenby, Gen. Hurst, Gen. McNary, and others, were all instructive on their topics, and enjoyed as only farmers who have taken a three days' rest for the purpose, can enjoy a brief season for pleasure and profit.

BROWN COUNTY.

The condition of agriculture in Brown county, for 1885, is still progressive, yet there are some points to censure, and there are many to commend. Our land, as may be learned from former reports, is generally productive, and in some localities very fertile. Methods of farming are constantly improving, but we still have some very poor farming. This is not confined to any one section, but may be found in neglected farms occasionally throughout the county. They are only as so many dots upon a vast field, yet we are, possibly, no worse than other parts of the State, as every county unavoidably has some shabby farms. The natural quality of land may be faultless, yet there are farms where fences may be considered the only disgrace; while all the cultivated land is in good condition, there may be almost a rod in width on each side of the fencing that is next to impenetrable on account of vines, bushes, and briers, which, if properly cleaned out, would be more productive than any other part of the land. Where such is the case, the good, easy-going farmer cultivates his land a little further out from the fences every year until his fields are much diminished in area, and he is compelled to commence cleaning his land anew or to sell it to one who will put it in proper order. While there is land that would be the better from ten or fifteen years' growth of bushes and briers, the chief trouble consists in letting a growth of such a nature take possession of some piece of ground that will naturally produce a good crop, and letting the land that needs rest and shade lie bleaching for want of either grass or briers, or any kind of growth that would rest and recruit such land to its original condition.

Timber culture is not receiving the attention that it should to make it a success, and the very few farmers who do give the subject a few careless thoughts and let a few trees come up and grow where they will, are not promising a very rapid advancement. There is enough waste land to grow all the timber needed for beneficial results to agriculture in the county. The waste land along the water courses, the abandoned hilly land that years of washing and poor farming has, in a manner, rendered worthless, are the kinds of land that need to be started in a growth of young timber; such, if begun in time, will keep up a supply for the future if used in a prudent manner. Many farms now considered run down and depreciated in value, with a changing of fences, cleaning out old fence rows, and starting a young growth of timber trees on land not suitable for cultivation, will, in a few years, with properly farm-

ing the cultivated land, be as desirable as any in the country. One fault that may be criticised is the habit of leaving shade trees standing in the fields alone, where probably the land is best suited for cultivation. If the tree is young, it will most certainly produce a very large top and but a short body, so that the tree is almost useless after years of growth, except for fuel; but if a number of trees were planted close together on some piece of land not suitable for profitable or convenient farming, in the same number of years it takes to produce the single shade tree, the owner of the land has a young forest which money would scarcely induce him to destroy. We need our forest and cultivated land more judiciously distributed. How little do our farmers often appreciate a small strip of forest bordering on cultivated fields until it is all cut away. If the southern portion of Brown county had the proportion of forest that the northern portion has, the advantages to agriculture would be very great. One can scarcely realize the benefit falling leaves have upon fields in near proximity to the forest land. Even the large quantity of fruit trees are having a visible effect on the fields adjoining the orchards; but the leaves of most fruit trees do not serve so valuable a purpose as natural forest leaves, because they fail in being carried so plentifully over the fields. We need more decaying vegetation upon our lands generally, such as leaves, weeds, and grass, to rot down on the fields. More general resources are needed for feeding our lands. We have too much mowing meadows out by the roots with improved mowing machines, unless farmers are going to sow fresh meadows every year.

While grass growing is improving, yet it should be much more extensive. There is not enough sod land for the amount cultivated in crops, and often the sod fields are pastured or mowed until they are but little more improved than if they had been cultivated in an exhaustive crop. Many fields sown in grass are really but half sown, as far as the quantity of seed is concerned, and thus they never can produce a full crop of grass, or form a sod that will improve the land. Then, after one good winter's freezing, it might be thought that grass had never been sown upon it, and the ground is plowed and planted in a more draining crop, and the farmer finds the land but little improved; but if this same land had a heavy sod upon it the first year, it would probably continue to hold a sod for several years; then, when brought back to a more wearing crop, the complaint is heard that the land is poor, when the real fault is that the land has not had a fair chance to rest. As hay brings the highest proportionate price of all farm products this year, it may be reasonable to presume that a larger area of land will be sown in grass than ever in any one year in the past. Our farmers would profit largely in saving their meadows if they did not mow them so close to the ground, thus preparing them to perish if a severe drought should set in after harvest. In such a case, an examination will show the roots of the grass to be very generally killed.

A matter of serious neglect that should be considered most carefully is the manner in which weeds along the public highways are permitted to grow. This is a rapidly increasing nuisance. Since the stock law has become generally enforced, almost every variety of weed common to our soil has sprung up along our public roads, and are producing seeds that the winds are carrying over the cultivated fields. We need a law to prevent weeds from growing to maturity along the public roads, as much as we do to keep them in order for public travel.

It is more to be observed this year than any preceding one, that the corn crop is receiving the most attentive cultivation of all our agricultural crops. This is very commendable, as the extreme care of such a large part of our farming population on tobacco culture for the last few years, had very materi-

ally lessened the care given the corn crop; but the sad decline in the price of tobacco has again sent our farmers back to corn growing with an olden time vigor that has already made itself prominent throughout the county, and, doubtless, in a very short time will be deemed a happy change. One criticism may be offered, and that is not having a sufficient quantity of rested land for this crop, as it is a well known fact that it is one that will not bear a repetition unless the soil is very fertile. Really, no land should have two successive corn crops upon it unless highly fertilized by some manner of manuring, and even then it should be followed not later than the third year by some crop whereby it could be turned again into pasture land and receive another period of rest. While there are other criticisms that might be offered, yet there is much to commend. When comparing the various features of agriculture—with reference to the land—with what they were forty years ago, the contrast is truly very striking, and our progress is the more prominent the more we dwell on the past, and if the lands were naturally as fertile now as then, our farming would still be more desirable.

The fencing is speedily becoming one of our most serious questions for our agricultural convenience. While the stock law renders outside fencing in a manner unnecessary, yet there is no farm but actually needs a certain amount of fencing. There must be some means of sub division, so that one part of the farm can be cultivated while another part can be pastured or rested. Fencing-timber has become so scarce that many of the farmers have not enough timber upon them to even keep up ordinary repairs. Hedge has been resorted to in many instances; but there are objections to hedging that can not be considered slightly—such as trimming, and the amount of ground that is wasted by the hedge growth. Thus the question of fencing must be one that will require many years to determine fully as to the best and cheapest methods.

Brown county fair at Georgetown continues to be as great a success as it has at any time since prohibiting races and all games of chance. The society has been able to increase the premium list every year since that time, and now pays out more money than any fair in this part of the country, so that the theory advanced by all who hold that a fair can not succeed unless the largest premiums paid are for races, seems exploded. It is now six years since our board rejected all races from our premium list and abandoned our race-track, and placed the fair upon a higher plane of progress, and every year since that time the fair has increased both in finances and popularity with the people, until now it is entirely out of debt and has a small surplus, and with the addition of the annual allowance from the county, will have a very respectable sum to begin the year 1886. Besides this, during the period of six years before stated, many permanent improvements have been made upon the fair ground, all of which have been paid for out of our annual receipts; also a debt of two thousand five hundred dollars has been entirely paid off, and we now pay a larger premium list than at any time within the history of the society, extending over a period of thirty five years, and the patrons have become convinced that a fair even must be judged by its moral status. When a few years since those who dared to denounce races as no part of an agricultural fair were few, now they are largely in the majority. Now they hold that races are allied with, and surrounded by the most pernicious influences. There are those who claim that there is no harm in testing a horse's speed, but while this is true, there seems to be a class of surroundings as soon as it assumes the form of a race that stifles every other influence. Besides this, the fast-horse man never knows when in modesty to stop demanding more and larger premiums, or, as they call it, first, second, and third moneys; and when an agricultural society yields to their demands, they will allow every other interest of aid to the society to be crushed out.

BUTLER COUNTY.

The Thirty-fifth Annual Fair of Butler county was held on the 6th, 7th, 8th, and 9th days of October, 1885, under the most favorable auspices.

The number of entries in the several departments exceed those of former years.

The attendance was greater than any fair ever held in the county. In fact, the Butler County Fair has become one of the institutions of the county, the citizens of which make as much preparation for the event as for any long established holiday.

The result of the harvest of 1885, in comparison with the former years, is as follows:

Corn, 115 per cent. ; wheat, 33 per cent. ; barley, 20 per cent. ; oats, double of former years ; potatoes, 85 per cent. ; tobacco, 105 per cent. ; hay, 75 per cent. ; quality much better than former years ; clover hay, 50 per cent. ; quality, same. Clover seed sown during the spring of 1885 was half lost by the wet and freezing weather.

The fruit crop of the county, as compared with 1884, is as follows:

Apples, 25 per cent. , with the exception of an occasional orchard with full crop. Pears, cherries, and small fruits a full crop.

In a few localities there has been some sickness among hogs, but generally they have been and now are in a healthy condition, and number equal to former years.

The horses, cattle, and sheep in our county are in first class condition for the winter.

The acreage of small grain, sown during the past fall, is equal to any former year, and at this writing in good condition.

The receipts of the Association for the past year was \$12,543.48 ; expenditures were \$12,789.45, showing a deficit of \$245.97, an indebtedness of \$1 187.20, making a total deficit of \$1,433.17, which was caused by the large expenditure for permanent improvements.

CLARKE COUNTY.

A glance at the reports of the Secretary and Treasurer, herewith appended, will show that the citizens of Clarke county still cherish a healthy sentiment for their annual agricultural fair. Good weather brought out an average attendance, and nothing occurred to mar the enjoyment of the vast crowds, or perplex the management in the discharge of their duties ; indeed, unusually good cheer prevailed, and but few protests were made.

Manifestly our people are making steady and rapid strides in the improvement of horses. This year an imported Cleveland bay stallion made his debut in the show ring, a noteworthy event in our history, and indicates a keen appreciation of our horsemen, of the vast possibilities of advantage in breeding coach horses.

The cattle department hardly equaled in numbers the preceding fair, but no deterioration of quality was observed.

The Poland-China and Chester-White hogs appear to have rooted out all their former competitors, the ancient Berkshire breed having disappeared from our show-pens.

A goodly number of excellent sheep were on exhibition, notwithstanding the depressed condition of sheep-husbandry, many of our farmers fondly looking to the restoration of the tariff of 1867 as the harbinger of future prosperity, de-

spite the logic of events pointing to a larger carcass and more wool to the square inch of surface as the more probable solution of their difficulties.

Agricultural hall was teeming with the fruit of a bountiful harvest, and fine art hall resplendent with the choicest specimens of handiwork.

The meager display of agricultural implements was noticeable, and visitors from a distance queried why it was thus in a city with a world wide celebrity as a manufacturer of articles in this line.

Our harvest has been abundant excepting wheat, which did not, probably, average eight bushels to the acre, and of a very poor quality, ranging in price from 65 to 85 cents per bushel.

The Colorado beetle is practically vanquished, and the ravages of the cabbage worm very much diminished; hence, the production of these staples will be more uniform in the future.

Corn yielded unusually well, but its quality was impaired somewhat by the September frost.

Oats were very much damaged by grasshoppers, some fields being utterly destroyed; their depredations in some meadows were also quite manifest.

The so-called hog cholera is still making terrible havoc in some portions of our county; it appears, however, to be more sporadic than epidemic.

Quite a number of valuable horses succumbed to distemper this year, its unprecedented virulency defying the best devised treatment.

A joint sale of Shorthorn cattle was held on our Fair Grounds October 29th; although the day was most inclement, fair prices were obtained. It is hoped an annual sale of this kind will be maintained.

An agricultural report of this county would be incomplete without some reference to the phenomenal speculative fever with which some of our leading farmers have been attacked. Early last spring Bohemian oats agents made their appearance in our midst. Their advent was as unobserved as the snow-bird's, when the chilled autumnal wind portends the wintry frosts. The first unfolding of their plans, by which sudden and fabulous wealth could be secured, dazed the sturdy farmer, and a repulse was the result; but knowing the most vulnerable point in human nature, they directed their appeals straight at the pocket-book until their point was carried. But now, these agents, reinforced by last spring's adventurers, are making a more vigorous canvass; the former, urged by a desire to realize \$2 50 per bushel for selling the crop of oats; the latter by an anxiety to see their oats metamorphosed into cash at the rate of \$7.50 per bushel, and their minds relieved of an impending mortification consequent upon so doubtful a venture. In justice to these agents be it said, that they have redeemed every pledge, and their oats freighted balloon soars high, and in the minds of some the talismanic power of every grain is equaled only by the magic of Aladdin's lamp or the philosopher's stone.

CARROLL COUNTY.

The Thirty-fifth Annual Fair of the Carroll County Agricultural Society was held on the society's grounds October 6, 7 and 8, 1885. These grounds are situated about one-fourth of a mile from Carrollton, the county seat of Carroll county, Ohio. The grounds comprise between twenty seven and twenty-eight acres of land, a beautiful site, almost level, a forest of oak trees, a good half-mile driving track, three large wells of never-failing water, one large two story floral hall 55 by 60 feet, one vegetable hall 45 by 55 feet, built this fall, one secretary's office, one treasurer's office, a check office, seventy new box stalls for horses, one hundred and thirty new stalls for cattle and

hogs, built last year. This society is increasing every year in every department, and growing in interest. The town is improving. The county commissioners are building a magnificent court-house.

The first two days of our fair were cold and wet, which detained our progress. Many of the entries were made on the morning of the 8th; it cleared off, and the sun shown out, and by 11 o'clock the grounds were well filled with people horses and vehicles. We have no charges at the gates on the first day of the fair, it being taken up with making entries and arrangements for exhibits.

The horse department was one of the largest ever held in the county, and of the best quality, being Normans, Clydes, Cleveland Bays, Morgans, etc.

The cattle department was very large, it consisting of Shorthorns, Holsteins, Jerseys, Aberdeens, Angus, and many grade cattle.

Our sheep department was not so large as last year, but made it up in quality. We have as fine and as good sheep as this State can produce, some having taken prizes at the New Orleans Exposition.

The swine department consisted of Poland-Chinas, Chester-Whites, Berkshires, and many other small breeds, with the lop eared, long-nose, razor-back, and sharp shooter.

Our show of poultry was immense, with an incubator hatching them out all the time, on the ground.

We had many curiosities and novelties for sport and pleasure. We do not allow any alcoholic drinks bought or sold on the grounds. The trials for speed were very interesting and exciting. The colt trot was in 2:45, the pacing race in 2:45, sweepstakes trot was in 2:28, and pacing in 2:26½.

The floral hall was crowded with fine displays, J. W. Helfrich being at the head with gold and silver wares, clocks and watches, and jewelry of all kinds. The ladies did justice to their department by bringing to and ornamenting the floral hall with fine, fancy, and home-made work.

The vegetable hall was filled with grain, vegetables of all kinds, and even to pumpkins that weighed 196 pounds, and squashes that weighed from 50 to 75 pounds.

The wheat crop was a failure. The corn, oats, and hay crop were very good, and the apple crop was very abundant. Good winter apples were bought for 30 to 35 cents per bushel. Potatoes were plenty, at 40 cents per bushel. We had no peaches, and no end to berries.

This is a very healthy county, with no epidemics to man or beast. Carrollton was noted a few years ago for dogs, but they took a certain disease, called dog button, and now you can scarcely hear the bark of a dog, not even to the lap poodle.

The total amount of premiums we pay out is over \$2,000. This year the expense of building was \$800, and the running expenditures about \$700. The income of the present year amounts to about \$3,000. This is a fine county, with low taxes and cheap lands. We have stone-coal, limestone, sandstone, uplands, lowlands, good churches, good schools, good community, and we have generally a boss good time. Some buyers do well to come here for horses to ship East. There are a few good fat sheep here to sell almost any time; and if you want to buy a farm, come to Carroll county for it; it beats going West all to pieces.

CHAMPAIGN COUNTY.

Our Thirty-fourth Annual Fair was held the last week in August, from the 25th to the 28th, inclusive, at Urbana, Ohio, on the county fair grounds. The

fair was pronounced the most successful one held in twenty years. The patrons thereof expressed themselves in terms flattering to the managers of the society.

The total number of entries was very large. There were over sixty entries in the cattle department, a majority of which was Shorthorns, and the rest Jerseys and Polled Angus.

The exhibit of horses was very large, and of superior quality. The entries in this department numbered over two hundred, consisting of very fine draft, general purpose, and roadsters, of all ages. Among them were a number of imported draft stallions.

The exhibit of sheep was larger than that of the preceding year, and consisted of fine-wools, long-wools, downs, and grades.

The display of swine was of a superior quality, consisting of Berkshire, Poland-China, and Chester-White breeds. The hog cholera has prevailed to a large extent in the county.

The poultry show was good, but comparatively small.

The display of farm products was large, and of an excellent quality. Over two hundred and sixty entries were made in this department. The samples of wheat, corn, vegetables, etc., were of the finest quality, and could not easily be excelled by any county in the State. Wheat in our county was less than half a crop, while all other productions were an average yield.

The entries in farm and mechanical arts exceed one hundred, and the articles themselves were worthy of the highest commendation.

Fruits were shown in small quantities, the crop being almost an entire failure.

The exhibit of flowers was fair, and of superior quality and beauty.

The entries in the department of pickles, preserves, jellies, jams, etc., exceeded two hundred and twenty-five, and were of the very finest quality.

Nor were the ladies behind in the display of fancy articles and domestic manufactures, as more than three hundred samples of their handiwork were spread out for the admiration of the crowds who visited them.

The display of musical instruments, paintings, photography, etc., was elegant. All in all, the display in every department was one of which the county may justly be proud.

CLERMONT COUNTY.

Clermont county is situated in the southwestern portion of the State, upon the Ohio river, much of it rolling and undulating, and traversed by numerous streams and beautiful valleys in the southern and western portions of the county, while the northeastern portion extends into a level plain. The soil is diversified, from the deep rich alluvial deposits of the bottom lands, to the more clayey upon the rolling and undulating portions, to the deep black and fertile lands upon the plain. The farmers of this county are engaged principally in mixed farming, and their labors have been rewarded with abundant crops the past season, except wheat, which in many instances was an entire failure, on account of the severity of the weather last winter. The hay crop was an excellent one, and mostly harvested in fine condition. The oat crop was the finest ever grown within the county, and corn fully 25 per cent. above the average. Fruits and vegetables of all kinds were abundant. Pastures remained plentiful and green until late, and stock went into winter quarters in excellent condition.

The fair was held from September 1 to 4, inclusive. The attendance was large, and much interest manifested both by exhibitors and visitors. Every

department was well filled, and a determined energy shown to make this fair superior to all preceding ones. The whole number of entries was 3,584, with \$2,138.00 offered as premiums, and \$1,870.00 awarded.

The display of stock was excellent, there being 412 entries in the horse department, and 170 in the cattle, sheep, and swine.

The floral hall was well filled with fruit, flowers, needle work, dairy and pantry products, and fancy articles, showing the skill and taste of the ladies, and their determined effort in every branch of their labors to make grand displays. The thanks of the society are certainly due them for their untiring energies this year.

The society prohibits the sale of intoxicating liquors, or of gambling in any form, on or near the grounds; and by so doing secure very orderly fairs, there scarcely being a case of drunkenness or disorderly conduct within the grounds this year.

Our farmers are progressive, and are taking great pains to improve their lands and stock. Several tile factories are being operated within the county, and farmers are availing themselves of their privileges, much to the enhancement of the value of their farms. Clover is recognized as a cheap and good fertilizer, as well as a profitable forage crop. More thoroughbred animals are introduced into our herds of stock than ever before, and a marked improvement is seen in the young and growing animals.

Educationally, we stand in a very enviable condition, having many graded schools, academies, and private institutions of learning, while our rival districts are almost universally supplied with good brick school houses, good furniture, and abundance of school apparatus, placing our youth within easy access to a good literary and scientific education.

CLINTON COUNTY.

An account of what took place in agriculture in this county, for the year 1885, is in most respects, the same as in other years. This is an agricultural county, and the lands are well adapted for the growth of all products that are suitable to this latitude. Our farmers own their lands, and cultivate them with their own hands, to sustain themselves and families.

There is a good church and school house in every neighborhood. Most of the farms have the convenience of a good free pike to the county seat and to the villages of the county, and nearly all the post-offices have one or more daily mails.

The wheat crop was a failure; but a larger acreage of corn was grown than ever before, and the yield was great, and of a good quality, but not quite so sound as in some seasons. The oats surpassed those of all other years in quality and quantity; the hay was not quite so heavy; but was housed and stacked in the very best of order.

The potatoes were good, and so was the fruit crop. The pear crop never was better. Where there was a tree old enough, it bore bountifully.

The timber of this county is hard wood. The ground was originally covered with oak, hickory, sugar tree, elm, ash, black and white walnut, beech, poplar, bass, and other varieties.

The soil is limestone, and is such that after it is worn it retains fertilizers in the very best manner; so, that our farmers, by rotation of crops and barn-yard manure are able to raise, year after year, crops without diminution.

Much of our land requires under-draining, and the ten tile mills, which have been running for years, have been able to sell all they could produce. Our lands are well drained and well watered.

The hog cholera was bad in neighborhoods in eastern and southern parts of the county. The Poland-China is the favorite. Several other varieties are bred.

Among cattle—Shorthorns stand first in favor, and are most largely bred. Some of our farmers formed an organization this year, to foster and advance the propagation of Shorthorns; and they held their first annual stock sale in the Clinton County Fair Grounds. The general purpose horse takes the lead, yet there has been an increase of favor for heavy draft. Sheep are slightly on the increase, and most of our breeders have abandoned the wrinkled craze, desiring instead a sheep all covered with a long, fine, close staple of wool.

But few mules are raised. Farmers pay more attention to the production of poultry than formerly, and some are disposed to raise none but pure breeds. The export of turkeys, geese, ducks, chickens and eggs is suprising when aggregated.

There are no diseases deserving mention among our stock, except the hog cholera as above mentioned.

Our railroad facilities are ample, the county being traversed by three standard gauge roads.

This is a small county, having the least area possible, under the State constitution, yet our people are so much in favor of fairs, that four were held within its limits. The first was held by the County Agricultural Society, August 11, 12, 13 and 14, at Wilmington, where the Society has a perpetual lease of 32 acres of land for that purpose, on which is a 60 foot track for speeding horses. Some object to this feature of the fair, and will not patronize or attend it on that account. All such have an ample opportunity to patronize and attend a fair held at Martinsville, which has no speed ring, which fair is claimed, and justly so, to be purely agricultural. The second one held in point of time, but first in magnitude, was at Sabina, which place is in the eastern part of the county, where the Midland railroad crosses the Muskingum Valley railroad. The third was held at Blanchester, which is situated in the southwestern corner of the county; these last three, which are joint stock associations, all held successful fairs this year, and were able to pay all premiums, dollar for dollar.

The plums, currants and cabbage, each have an enemy; the late cabbages are by many protected by putting considerable dirt on the forming heads and leaves, which enables the head to grow and become large and solid in spite of the worm. As to the other, many things have been recommended and tried with varying success.

The depressing times and low prices have had an influence upon our people, yet our farmers are not disheartened, but are trying to educate their families and enjoy life.

COLUMBIANA COUNTY.

Few counties in Ohio have so many natural resources of producing wealth as Columbiana. Here is a soil peculiarly adapted to agriculture in all its branches, stock-growing, and, not least by any means, manufacture.

The county comprises about 480 square miles, and so lavishly has nature poured out her favors on us, that these hills, which are the chief characteristics of the southern and eastern portion, are not only specially adapted for cattle and sheep ranges, but are filled with coal, iron, fire and potter's clay.

The southeastern end of the county touches on the Ohio river, while Beaver creek and its tributaries cover the county from north to south, which, with other streams, furnish an immense amount of motive power to the manufactories situated on their banks.

While crops of all kinds can be grown, with like profit, in all parts of the county, our manufacturing interests are located where shipping facilities are of greatest advantage. Thus Salem, population about 5,000, and Leetonia, about 3,500, on the north, and East Liverpool, about 8,000, and Wellsville, about 6,000, on the south, located on the P., Ft. W. & C. R. R., and C. & P. R. R., respectively, are the leading, though not by any means, exclusively, manufacturing towns of the county.

As our manufacturing interests have a decided influence on the profits of agriculture, it might be well, at this point, to detail our towns and their industrial interests. As a guide to any one wishing to locate in our midst, the following will be of interest:

Salem, on the main line of the P., Ft. W. & C. R. R., produces the famous Buckeye engines, and has four stove foundries, one large machine shop, one extensive steel-wire nail mill, tile works, label works, planing mill, etc. Salem's local markets are said to be, to the farmer, as valuable as those of Pittsburg.

At Leetonia, on the same road, eight miles east, are located two large blast furnaces, and a rolling mill, which, together with the coal mines and coke ovens, employ about 9,000 men, and turn out thousands of dollars worth of finished products annually.

Columbiana, east three miles, on the same railroad, is another important manufacturing town of about 2,000 inhabitants. Farm implements of the various kinds, and buggies in large quantities are here manufactured.

At East Palestine, seven miles further east, also on the P., Ft. W. & C. R. R., are the Prospect and State Line coal mines, employing about 600 miners. Its population is about 1,600, and steadily growing. Business is on a solid foundation here, and strikes are of very rare occurrence. The product of the mines is nearly all sold to the Pennsylvania Railroad Company.

East Liverpool is the first town of importance in the county. In fact, it is now a city of the second class, enjoying all the benefits of extensive pottery manufactures, glass works, natural gas, and excellent shipping facilities by river and rail. Her potteries, and earthen-work establishments turned out, in the year just closed, over \$1, 00,000 worth of finished products. Her markets are superior to those of any of her neighbors.

At Wellsville, three miles below, on the Ohio river and Cleveland and Pittsburg railroad, are located extensive sewer pipe and terra cotta works, while the machine shops of the railroad and other works of like importance, contribute to the wealth of the community.

Silville, on the same railroad, 14 miles west, is a mining town of about 3,000 population, and is the centre of a comparatively wealthy farming region.

New Lisbon is the county seat, located centrally, about 10 miles from Salem and other towns north, and about 15 miles from those named on the south. Shut in, as it is, with only the Niles and New Lisbon railroad as an outlet, it numbers about 2,800 souls. It is a wealthy village, surrounded by a populous and rich farming region. Its hills are filled with minerals of all kinds, but mining is not extensively engaged in. Here are located two extensive sewer pipe manufactories, one of which is said to be the largest and best equipped of its kind in the United States. Certain it is, its products are of the finest quality, and meet with the readiest sale, not only in this country but in Canada. A new trunk

line of railway is building through this place, which will, undoubtedly, give an impetus to manufacturing enterprises, which will utilize the mineral wealth of the hills. New Lisbon is on the line of the old Sandy and Beaver canal, which had a brief existence of activity along in the forties. Its traces are seen in 14 splendid stone locks, just west of the town.

Besides the important towns above enumerated, there are many towns, ranging in population from 100 to 800 souls, each with its peculiar commercial importance. Hence, it will be seen, that in Columbiana county the farming population has many advantages in the matter of a large home consumption, splendid local markets, and extra shipping facilities. Our farmers, as a class, are of a high intellectual order, and there is literally a "school-house on every hill and a church in every valley." The old time methods of farming, which were good enough for our fathers, have given way to improved machinery, and intelligent thought is applied to farm work as well. The result of our liberal system of education is seen in handsome farm houses, commodious barns, with every improved appliance for lightening labor and developing the best and highest culture in families.

Improvement in stock-breeding is one of the most notable features of agriculture in Columbiana county. Thoroughbred Durhams, Jerseys and Holsteins are common in our communities, as well as Clydesdale, Percheron and trotting horses.

Our County Fair, we are glad to state, is improving with each year's exhibition. The last one held was notably a success. With the present year it is the expectation that the Fairs will be far ahead in point of interest and exhibits, of any institution in this part of the State.

Crops for the past year, with the exception of wheat, have been good, and while prices are not of the best, they are fairly remunerative, and the outlook is excellent.

Summing up, we again repeat, Columbiana county is a favored spot, and a glance at its people, its towns, its industries and its future, will convince any one that we know whereof we speak.

COSHOCTON COUNTY.

The Thirty-fourth Annual Fair of the Coshocton County Agricultural Society was held the 13th, 14th, 15th, 16th, and 17th days of October, 1885, on the spacious ground of the Society, near Coshocton, Ohio. The weather being unfavorable for the first three days, the Board of Directors decided to continue over until Saturday the 17th.

Our entries were larger than ever before, but the attendance was not quite as large as that of last year; consequently, our receipts were a little short, but were enough to pay our premiums and expenses, and leave us square with the world.

Our Board are all live men, and among the best farmers and mechanics in the county, and they do not intend to have our Society second to any in the State. We have put upon our grounds improvements, such as covered seats, sheep houses, cattle stalls, etc., for the convenience of exhibitors and visitors.

Our county is adapted to what may be called mixed farming. The usual crops raised are wheat and corn. Of wheat, the Fultz is the principal variety raised, but does not give general satisfaction to millers for commercial use.

The crop this year was almost a total failure, owing to the cold, freezing

winds of the previous winter and lack of snow. New varieties are being introduced, which will give better satisfaction. The crop of corn was a fair one, but difficult to save on account of the wet weather. The yield of oats is large, but considerably damaged. Potatoes give a fair yield, and good in spite of the Colorado beetle, which was very troublesome.

The fruit crop was a failure, there being hardly apples enough for home use; peaches none, and small berries very scarce.

Our farmers have, within the past few years, greatly improved their stock. Thoroughbred cattle, horses, sheep, and swine have been introduced throughout the county. Shorthorn cattle seem to be the choice with dealers for commercial purposes, but the Jerseys, Holsteins, and Devons have their admirers among farmers for dairy qualities. Fine specimens of stock of all kinds were on exhibition at our late fair.

The display of flowers and horticultural products of every kind was good. The ladies of Coshocton county do not forget nor neglect an annual exhibition. The display in the halls of their handiwork was a decided success, there being lively competition in all these classes.

We are pleased to report the fact that the fine art department has made quite a rapid stride in the right direction in the last two years, and there were some very fine specimens of drawing in fine art hall.

The agricultural events of the year closed with the farmers' institute, held under the auspices of the State Board of Agriculture and the county Society, in the village of Coshocton, December 29th and 30th. Notwithstanding the incessant rains during the meetings, the attendance was fair, made up of the representative farmers and fruit growers throughout the county, and the institute a splendid success. Lectures by Secretary Chamberlain, Gen. Hurst, Ohmer, and Prof. Lazenby furnished abundant solid instruction for the farmers and fruit-growers to digest and practically apply on the farm, the orchard, and in the home. The good results of the institute to the agricultural and horticultural interests are invaluable.

The condition of agriculture in Coshocton county is probably the average of the other counties of the State.

The prosperity of our farmers is plainly shown in the appearance of their farms and the numerous splendid houses and barns which are being built; good taste is displayed in the style of architecture. The log houses and the old log barns with clapboard roofs have about all disappeared, and in their places are being built commodious brick and frame dwellings, and large and convenient lawns. The variety of our soils being adapted to all kinds of cereals, fruits, and vegetables, and our coal fields, as yet undeveloped, together with our water power and other advantages, offer an opportunity for capitalists to invest with profit. Commercial fertilizers are being more freely used than formerly, and tile draining is coming into use on low lands.

CRAWFORD COUNTY.

The general condition of agricultural interests in this county is good. The wheat crop was a fair average yield. The corn not so good on account of grasshoppers. A small cyclone swept through the northwestern and northern part of the county, breaking down a great deal of corn, also destroying considerable timber in its track. The oats was very much injured by the grasshoppers. In some fields I saw many shocks with grain all eaten off. The hay crop was immense; the best the county ever had.

The farmers throughout the county are all greatly interested in tile draining;

and a good many tile were used this season, and in many places, where two or three years ago were marshes and waste land covered with weeds and underbrush, are now finely cultivated fields, yielding enormous crops, a soil of rich, black loam.

The school interests of the county are in a prosperous condition, and almost every district in the county has a nice brick school house, with all the modern improvements, while the general attendance to the common schools is reported better than it has been for years past.

The farmers generally have turned their attention to the new and better method of farming. The latest improved machinery is the only kind that meets with ready sale. The breeders of stock are not idle, and better horses, cattle, and hogs are seen as the result.

The Grange is in a flourishing condition, but the Farmers' Club is not exactly prosperous.

CUYAHOGA COUNTY.

This county is situated in the northeastern part of the State, and borders upon Lake Erie. The Chagrin and Cuyahoga Rivers are the principal streams, and both of these are small. The land is gently rolling, except along the streams, where it is quite broken and hilly. The soil of a narrow strip along the lake is sandy. The remaining portion is mostly clay loam, containing small gravelly areas.

The city of Cleveland, containing a population of over 200,500, is situated in this county, and upon that fact the kind and extent of agriculture depends quite as much as upon the natural characteristics of the land.

In the vicinity of Cleveland grapes and small fruits are cultivated in abundance. Along the lake shore peaches have been quite successfully raised, but this year were a total failure. In the remaining part of the county apples, pears, cherries, and other small fruits are produced, but have not been so abundant this year as in some former ones.

This county is as fine a one as any in the State for agricultural pursuits, the products and industries being varied, the soil productive, markets good and easily accessible.

The past season the crop of wheat was above the average. The oat crop was injured by rains during harvest, but a very fair crop was realized. The corn crop is good. Potatoes are rotting badly.

Many are engaged in producing milk and butter for Cleveland use. There are, however, a few cheese and butter factories in the county, which are fairly patronized. There are also large oleomargarine and suine establishments in Cleveland, which have injured the farmers seriously, but the outlook now is that they will be short lived, as the health officers have taken the matter in hand and pronounce the counterfeit butter unwholesome.

There is some excellent thoroughbred stock, but no prominence has been given to that branch of agriculture in this county.

Great progress in the methods of farming has been made in the county within the last few years, particularly in the matter of fertilizing. The farmers are utilizing their own refuse matter and using commercial fertilizers freely. The farmers' institutes, under the auspices of the State Board of Agriculture, held in this county have done much toward the progressive movement. More attention is being given to the subject of tile draining. Schools and churches are fully appreciated. The Thirty-seventh Annual Fair was held at Chagrin Falls September 1st, 2d, and 3d. The races, which would have been on the 4th, on account of the rain, being postponed until the 5th.

DARKE COUNTY.

Darke county, ever true to its trust, has produced one of the largest as well as one of the finest crops of cereals the last year known in its history.

The corn was especially large. The average of wheat was not as large as in some former years, but the yield has seldom been equaled, this fact I attribute to the manner in which our farmers prepare their ground. Having learned by experience that fallow ground seldom, if ever, fails to produce a crop. There is a growing tendency to use fertilizers on wheat lands, and the results generally show the wisdom and profits of such a course. Clover sowing for fertilizing is growing more in favor with our farmers.

One of the principal crops of our county is corn, especially on our black, rich valley, which have been thoroughly drained. The bulk of the crop being fed to hogs on the farms where it is produced, unless prevented by the hog cholera which is so prevalent. Thousands of hogs died during the last fall, the mortality being so great that within the last six months two rendering establishments have been started for the rendering up of the same, both of which are now doing a large business.

The fruit crop was almost a total failure, there seeming not to be vitality enough in the trees to produce good, healthy fruit.

Live stock has generally done well, and the standard notability in this department is each year increasing. The demand for blooded stock of every description is largely on the increase; also, especially in cattle, there being representatives of five different families exhibited at the fair held at Greenville, September 12 to 18, all of which were fair specimens.

The Agricultural Society had quite a success of its thirtieth fair, there being 2,250 entries, and its total receipts \$10,495, and paid in premiums \$4,070, which will leave the Society only about \$500 in debt, with one of the finest fair grounds, together with the best improvements, in the State, which all our people feel proud of, and regard the fair one of the most potent agencies by which they may meet and renew sociability.

The educational interest of our youth is not neglected by any means, our people neither sparing time nor money to provide facilities by which as good an education can be got in our county as any place in the State. Each sub-district in the county is provided with a good, substantial brick school-house, and at the surrounding villages there are graded schools with competent instructors, whose educational qualifications fit each to fill the professors' chair. Besides these, Greenville has two buildings with capacity for 1,500 scholars. The last one was built at a cost of about \$45,000.

The Granger organizations of the county have all ceased to exist, and for all the good that they ever did, it would have been as well had they never existed, for the social interest and home life of our farmers are as well maintained since as before the organization was ever known.

DEFIANCE COUNTY.

In compliance with the law, for a written report of the condition of agriculture in Defiance county for the year of 1885, I beg leave to submit the following brief statements in the order suggested by you.

1. Our county is quite level, except along the rivers and smaller streams, whose bluffs are sufficiently high to afford excellent drainage for the table

lands extending back from them. The soil is diversified, from the rich, black loam of the bottom lands to the stiff clay of the bluffs and lands adjoining them—back from the bluffs, most of the soil is equal to and partakes of the nature of the river bottoms. Occasionally sand ridges are found making choice building spots for the homes that are springing up all over our county.

The timber, mostly hard wood, such as oak, hickory, ash and sycamore, is being rapidly consumed, because hitherto the most valuable; but of late the elm and cottonwoods are proving of great value, resulting in the clearing up of our elm lands, which are found to be our very best.

Apples do well and are extensively raised.

Peaches do not thrive of late years, and are neglected. Doubtless the clearing up of this country has changed our climate, for I am told that in its early history, twenty to thirty years ago, Defiance county was noted for its bountiful peach crop.

Winter wheat, corn, oats and sorghum all do well in good seasons. Hay, however, is becoming a more important crop than heretofore, and is perhaps the leading crop of the county.

Among other vegetables, the potatoes, cabbage, onions, squashes, beets, etc., will compare favorably with the product of any other county.

2. Great attention is given to the raising of improved breeds of stock, chiefly among the horses, cattle and swine, and this is fully confirmed by a comparison of the entries made in these classes during the past year with those made say ten years ago. Our farmers find that money spent in this direction brings comfort and wealth.

3. As a rule, our farming is carefully and neatly done. The buildings good. Fences, where the rails have served their time, are being replaced with wire, or some modern patent movable material. Where you find good houses you will find good barns, but sometimes you find good barns and only moderate but comfortable houses, the barn being considered a prerequisite to success.

4. Tile draining is in its infancy, and yet a large amount has been placed, and wherever introduced the adjoining farms are bound to follow as soon as they can spare the means so to do. In fact, it is regarded as the next important step after fencing. I am pleased to note that tile manufacturing has become a prominent industry here, and kilns for their manufacture are found in many parts of the county.

5. The condition of society, socially, morally and intellectually, throughout the county, is good, as evidenced by the good schools and numerous churches. As prominent aids to the well being of the people, the numerous Granges and Farmers' Clubs, are important factors.

6. During the past year the crops, with the exception of late oats and clover, (destroyed by grasshoppers) have been good, and I might except corn, which, owing to late rains and warm weather, has not matured or cured very well.

An increased acreage of winter wheat has been put in and our farmers are beginning to forget the existence of hard times, and though happy and prosperous, they are ready to extend the hand of welcome to all new comers who desire to come amongst them and open up new farms or improve the old.

DELAWARE COUNTY.

Delaware county is pre-eminently calculated for mixed farming; its location and variety of soils make the cultivation of any crop raised in Central Ohio a possibility.

The county is traversed by the Scioto and Olentangy rivers, giving a large

amount of bottom land as well as very much rolling upland, all of which is suitable for the cultivation of wheat, corn, oats, clover, and potatoes; and the average farmer expects to raise all of the above crops every year.

The wheat crop of 1885 was very much below the average, the corn crop above the average, the oats crop fully up to the average, and the potato crop fully up to an average.

Pastures were unusually good during the most of the season, and stock went into winter-quarters in good condition. Timothy meadows were good, and the hay was secured in good condition. Clover meadows were badly frozen out, not much hay and very little seed were saved. A larger percentage of the corn crop was cribbed before winter set in than usual.

Farmers begin to feel encouraged, and look forward to better times in the near future. Horses, cattle, sheep, and hogs are extensively bred and raised here. There are several companies in the county engaged in the importation of draft horses from France, Scotland, and England, and the improvement in our grade horses has been so successful that buyers from the East make their headquarters in Delaware city, and very many fine specimens of the noble animal are shipped from here to the eastern market.

The breeding of cattle is also one of the principal industries of the county. Short Horns, Devons, Holsteins, and Jerseys, all have their friends and admirers here. The Short Horns undoubtedly stand at the head of the list for beef, the Holsteins for milk, and the little Jerseys for butter. Merinos, Southdowns, Cotswold, Leicester, Shropshire, and Oxfords made up the list of sheep; while the Poland Chinas, Berkshires, and Chester Whites are the leading varieties of hogs.

The subject of tile draining is engaging the attention of our farmers to quite an extent, and we have several extensive factories in operation, and all report the business good.

Our county fair, held on September 15, 16, 17, and 18, 1885, was by far the greatest success ever attained by our society. The weather was delightful, and every department unusually full, the number of entries reaching nearly twenty-five hundred. The receipts from all sources were larger than ever before. We expended about one thousand dollars on permanent improvements, paid all premiums, and reduced the indebtedness of the society \$250.00, and have a small balance in the treasury. Upon the whole, we are, as a society, greatly encouraged, and expect to make the exhibition for 1886 more deservedly popular than its predecessor.

ERIE COUNTY.

The Erie County Agricultural Society held its twenty-seventh annual fair on its grounds in Sandusky on September 22, 23, 24, and 25. As a whole, this was undoubtedly one of the most successful fairs ever held in Erie county. The weather on the opening day was threatening, but towards evening cleared away, and during the remainder of the week it was all that could be desired. The stock department was filled to overflowing, taxing the stable accommodations to their fullest capacity. The fruit and vegetable exhibit was very fine. The fruit display was a great surprise to our fair managers. The fruit crop—especially apples, which were nearly a failure—was an exhibit equal to that of any preceding year.

The poultry show was large, and reflected credit on our breeders. The arrangement of our exposition hall—which covers all goods except agricultural implements, carriages, and wagons—was pronounced far superior to that of any previous year. This grand exhibit of Erie county's wealth was so largely

due to the management of Mrs. Lane Lockwood, of Sandusky, who so kindly volunteered to superintend this department, that we beg leave to insert the lady's name in this report. The show of agricultural implements was not quite equal in quantity to that of former years, yet the display was very creditable. The attendance during the entire week of the fair was in excess of any former year, and on Thursday the people were variously estimated at from 17,000 to 21,000. No intoxicating drinks are allowed on the grounds. Fortune wheels, as well as all other gambling devices, have been denied the grounds privileges for years. The people of our county take a great pride in their fair, and its history has never been marked by sectional bitterness. The grounds are deeded to our county commissioners, which has given our people a feeling of direct ownership in the property. This personal and common interest in its welfare has taken from its management the jealousy that has so often worked the downfall and final death of many an agricultural exhibition.

In the past five years there has been a decided improvement in the breeding of thoroughbred cattle, sheep, and hogs. The breeding of thoroughbred Herefords has received a decided impetus by the bringing into the county importations directly from England by several of our leading farmers. The black and red Polled Angus are also well represented by direct importing from Scotland. The Holsteins, Jerseys, and Ayrshire are numerous. In the past year a very large number of high grade Holsteins have been shipped here from New York.

The breeding of better horses has received much encouragement, and in the past two years several imported Norman and Clydesdale stallions have been purchased by our breeders.

The thoroughbred Berkshire and Magee are the favorite hogs. But very few farmers can now be found who do not show an entire herd of swine that are entitled to a place in the swine register. Ten years ago the Chester White was the only improved hog known. Now he has been almost forgotten in this county.

The award of the first premium to our county for the best county display of farm products from any one county in Ohio at the World's Fair at New Orleans last winter—1884 and 1885—has been a matter of much pride to our leading farmers.

Annually, for many years, a farmers' harvest picnic and reunion, under the auspices of our society, has been held during the month of August. These gatherings are largely attended, not only by our farmers, but by our city people, who take this occasion to mingle with their country friends and talk business and politics, as they wish. The day for the reunion, this year, was a showery one, raining the entire forenoon. At mid-day the sun came out bright and cheery, and some three thousand people came in during the afternoon. Governor Hoadly and Hon. W. N. Cowden were present, and delivered eloquent and interesting addresses.

There are three Grange organizations in the county. They hold monthly meetings in their respective townships. A mid-day feast of good things, with the afternoon passed in the discussion of agricultural topics, interspersed with music, recitations, and the reading of original essays on matters relating to farm life, is the usual programme. But little, if anything, is now accomplished in the way of bulk purchases of groceries and other goods by the organization. While the Grange organization of this county may have failed to accomplish everything sought for by some of our over-enthusiastic members of the order in a commercial sense, yet socially it has been a great power for good. It has broken up the isolated condition of many families, and aroused a feeling and

sentiment of rivalry and emulation, which is now apparent in the improved appearance of fences and farm buildings, and the bettered condition and breeding of live stock, with new and improved methods of general farming, as seen when driving along our highways.

The wheat crop of the county was, in many instances, an entire failure. Many farmers seeded quite early, producing a rank growth that in the succeeding severe winter was badly killed. Many fields were plowed up in the spring and sowed to oats and barley, or planted to corn. The corn was a fair crop, but failed in ripening in unfavorable localities. Potatoes yielded bountifully. On wet and low black land they rotted considerably. Oats were excellent. Apples were about one-fourth of a full crop. Peaches were an entire failure, and many peach-orchards ruined. Our vineyardists suffered the loss of two-thirds of their crops, and many fine vineyards were seriously injured by the severe winter.

While the wool interests have been considerably depressed, yet our wool-growers find their accounts footing fully as much net profit as any other department of the farm. We have a county wool growers association, officered by live men, and the five hundred flock-masters of the county need to rally to its support in making it efficient in promoting the wool interests, and as a strong auxiliary to the State organization.

FAIRFIELD COUNTY.

The principal crops raised in this county are wheat, corn, oats, rye, barley, buckwheat, potatoes, meadow and clover hay. The wheat crop was not one-third of a crop, on account of the severe winter and the late spring. The corn crop was, perhaps, the largest ever raised in the county, as to the number of acres planted, and also as to the yield per acre. The potato crop was also very large. Fruit was a good crop, with the exception of peaches, which were an entire failure.

Live stock of all kinds suffered little, if any, from contagious diseases during the past year.

Our farmers are still continuing to reclaim the low, wet lands, by the use of open and tile drains; in a great part by tile.

Wonderful improvement has been made in the stock in this county within the last ten years, as well as in every other department of agriculture, and if an animal of the breeds that predominated here twenty years ago should be exhibited at our fairs to-day, such an animal would be regarded as an object of curiosity, and would perhaps attract more attention than our now familiar herds of thoroughbred stock.

Our farmers build good, substantial houses and barns, and use improved agricultural machinery of all kinds. The condition of society, socially, intellectually, and morally, is of the best, our county being second to none in the State. In fact, the people of our county are keenly alive to whatever tends to keeping pace with modern civilization.

Our roads are improved under special laws, which give increased tax levies; and all our roads are being put in first-class order by the use of gravel, which is found in abundance all over the county, and we now have a great many free turnpikes.

Fairfield county has just passed through a successful fair, but its receipts were not as large as last year, for the reason that on the first two days the receipts were nothing, as it rained continually during that time, but the last two

days were far in advance of any other year, which only made our receipts short several hundred dollars. The society has a bright future before it. The premium list was further increased to meet demands that were made, so that the amount the society offered in premiums and purses was \$7,500 00, and the amount paid out of this sum was \$5,993.15, which was several hundred dollars in excess of all former years that this society has passed through. The highest hopes of the ardent friends of the society have been reached. Visitors pronounce our fair grounds the most convenient grounds in the State, and our track has been eulogized by old and experienced horsemen, who have seen all the finest and best tracks in the United States. This feature is something our society can be proud of, for it has spared neither time or money to make the grounds what they are. One of the first rules and principles of this society has been to pay all its premiums on the last day of the fair. So that all can get their premiums as soon as the awards have been made, the officers have the awards arranged so that they can pay them as fast as demand is made.

FRANKLIN COUNTY.

The Franklin County Agricultural Society has not held a fair since the State Board of Agriculture has occupied the county society's grounds. The agricultural interests of the county will compare favorably with any county in the State; and while our lands may not be as good for the production of wheat, oats, and potatoes, as those of some other counties of the State, yet for hay, corn, and grazing purposes, they can not be excelled. The wheat crop of 1885 was almost a failure. A large acreage was sown, but few fields, except when protected by timber on the north and west, yielded enough to pay for harvesting, and that of an inferior quality. Oats looked unusually fine, and promised an abundant crop until within a few days of cutting, when the army worm attacked the later varieties, such as White Russian, and many fields were stripped of their oats in two or three days. Fields promising fifty bushels per acre yielded ten to thirty bushels, and many fields of early oats, not then cut, yielded from forty to sixty bushels per acre. Potatoes gave a fine yield, and were of good quality. Hay probably averaged one and one-fourth tons per acre. But little clover was cut (mostly frozen out during the previous winter). Corn, the principal crop of the county, is the finest and largest crop ever raised in the county, a larger acreage than usual having been planted, owing to the failure of wheat. The corn which was planted early is remarkably solid, while that planted early in June did not at all mature. This corn made splendid feed for cattle, however, many breeders preferring it to the more solid corn.

More cattle have been fed this winter than usual. Farmers lost most of their hogs by cholera, hardly a neighborhood in the county escaping. The majority of the hogs lost were young animals.

A large portion of the lands adjacent to Columbus are used by market gardeners, and yield abundant crops of vegetables and small fruits. Apples yielded a fair crop, and were of fine quality. Pastures during the summer were abundant; consequently stock goes into winter quarters in better condition than usual.

All in all, the appearances indicate increased prosperity with first class farmers, notwithstanding the depression in business complained of in other occupations.

FULTON COUNTY.

The Twenty-eighth Annual Fair of the Fulton County Agricultural Society was held September 17, 18, 19, 1885, and was a success in all its features. The Society owns one of the most beautiful fair grounds in the State, containing forty acres. The track is situated on one side of the grounds, and the balance, or about twenty acres, is a beautiful natural grove. Ample grounds for parading and plenty of seats for resting and visiting, in a clean, well sodded grove are what our people and visitors appreciate and enjoy. The track will hereafter only be used for pleasure driving and for exhibiting horses and other stock, in a proper manner, the Board of Officers having decided to have no more modern "agricultural horse trots" and "running races," believing that there is "no good" in them.

The farmers' institutes and the Grange organizations of the county, together with the re-unions at the annual fairs, afford ample opportunities for social intercourse for the farmers and their families, and tend to stimulate a healthy, social, mental, moral and financial advancement.

A normal school or college has recently been established in the beautiful village of Fayette, in the northwest part of the county. This school is a great convenience, and of much value to the county and to Northwestern Ohio. The faculty are among the best of educators. The buildings are good, and the average attendance of students has already reached something over two hundred, representing many counties of the State, and several States of the Union and Canada. This school supplies a long felt need in this part of the country.

The county is still making advancement in general improvements. Open and tile draining being continually pushed forward. Many thousand of tile are annually laid in Fulton county.

A marked improvement has also been made in the erection of buildings, especially of barns and out-buildings, all, or nearly all, are built in the most modern style and finely painted.

The principal crops of the county are wheat, corn, oats, hay, clover-seed, peas, potatoes and apples.

Cheese and butter are produced to some extent; and water melons are raised to quite an extent in the sandy portion of the county.

Wheat crop of 1885 was good, above the average; the corn crop poor in quality and short in quantity; hay, average crop; clover-seed nearly a failure, the grasshoppers destroying it; oats, a good crop; potatoes, a fair crop, but affected badly by rot, about 25 per cent. being lost; apples, not more than 25 per cent. of an average crop.

Stock, excepting hogs, has been comparatively free from disease. The cholera destroyed many in one township. No cause of the disease could be ascertained, and no remedy found.

The low price of farm products is teaching our people the need of strict economy in the purchase and use of all necessary articles, and the demand for a better system of agriculture in all its departments. The land must be put in better and more productive condition by underdrainage and better and more perfect cultivation. Stock of all kinds must still be further developed and improved, better judgment used in the purchase of farm implements and the care of the same; in short everything pertaining to agriculture must be brought up to the very highest standard of perfection and economy.

GALLIA COUNTY.

The most comprehensive view of a community or a county, can be obtained by a birds-eye view of its statistics, industrial and social, and the necessary description to make the cold figures intelligible.

The 430 square miles of Gallia county contains 286,108 acres of land. Of the total only about a fourth are cultivated, a little more than this is pasture land, and the remainder is woodland, only a small portion being waste land. The surface is generally hilly, while the grand Ohio river and numerous creeks furnish some rich bottoms. The soil is a sandy loam mostly. The timber is hard wood—oak, hickory, ash, with much walnut.

The crops produced are the staples—wheat, corn, oats, hay, potatoes and tobacco. Wheat is grown on half the cultivated land, and though the average yield is not such as would place it among the profitable crops, yet its ready cash value and necessity at the family board will always make it a leading crop, even though its relative value should decrease. Corn is raised only for home consumption, as well also oats. It is only on the river bottoms that potatoes are the leading crop, and they are exported to the southern markets, together with apples, and some hay. Tobacco is the leading crop of the southern part of the county, and the yields have given considerable character to the people of that section of the county—building them nice homes, etc. It is hoped that its cultivation may extend over other portions of the county also, as it is the savior of the wheat-killed land. Apples are the leading fruit, the Rome Beauty being the prevailing variety. Our production of this fruit is sufficient in amount as to have a surplus for other markets. The mineral productions of Gallia are not so small as to escape notice. A large amount of coal is mined for the general market, and the completion of a projected railroad will open the Waterloo coal fields, the best coal in the State, as per Ohio Geological Report. Gallia Furnace, on the line of a new railroad, will open up and give its land to small farmers.

Horses—The mares have, for several years, been given to Hambletonian sires, and the slow-going farmer picked up half-breeds. Recently a Percheron, a direct importation, has been doing considerable service. The quality of horses has greatly improved here in the several years past, and their display at the County Fair is one of the most interesting features.

Hogs—No special feature to report. The quality has improved over the county, and you can not now find one of the old "long snouts." In the western part of the county they have a distinct breed, whose principal characteristic consists in having a hoof not cloven.

Cattle—The bovines enjoy the distinction of being the only class of live stock here that is constantly improving in numbers and quality. The breed is Shorthorn. The Jerseys are rapidly increasing also, and are ready sale.

Sheep—Here is an excellent sheep territory, and the increase in numbers was an annual occurrence, until legislation inimical to the interest was accomplished.

The Gallia farmer has built him better houses, year by year, but the depression in business and the almost entire failure of his wheat crop has made him a grumbling animal. He is waking up some now on county roads, a very healthy indication that the "blues" are disappearing. His social and educational advantages are not surpassed anywhere. He has taken a great notion to go west. Give us the German farmer; he has no need of the west. We have him here. He drops down on a briar patch, and in a few years he becomes the money lender of the community. Give me the Dutch and this land will blossom.

The general features of the county are much improving. The opening of

the Point Pleasant railroad bridge has placed a line of railway from Toledo to the seaboard, and we are a key in the position. A handsome and commodious building for the orphans—Childrens' Home—has been completed by the county, and a new jail will be erected the coming year. We are out of debt and fairly prosperous.

Our County Fair is not the biggest thing on wheels, but we have a quiet little show, annually. Keep out the fakirs and rum sellers, and though we don't accumulate, we keep even with the world, pay our debts, make improvements and hope for brighter lot in the bye and bye.

GEAUGA COUNTY.

The Fifty fourth Annual Fair of the Geauga Agricultural Society was held on its grounds, September 14, 15, 16 and 17, inclusive.

The people of the county showed, both by their presence and exhibits, each day, that the efforts of the officers and managers were appreciated.

The horse and cattle exhibits were unusually fine, and the departments of fine arts, domestic manufacture, canned fruits, etc., were very large. The Society expended during the year over five hundred dollars in the improvement of its grounds, which are assuming a very creditable appearance under the liberal management of the past few years.

The crops of this year were by far the best ever produced in the county, and fully made up for the failure of the years previous.

In conclusion we would say that the farmers of Geauga county are alive to the needs of their chosen calling, are energetic in pursuing those methods which have proved stable, are industrious in their daily work, are frugal and contented in their every day life, and are the solid and substantial men of the county.

A few features of our great success in the management of our fair are: First, racing, conducted under the rules of the National Trotting Association. Second, competition opened to the world in every department. Third, that each purchaser of a family ticket is entitled to make as many entries without additional charge, except in the speed and sweepstakes departments. Fourth, by sending personal notice with list of premiums, by mail, to each of our eight hundred members. Fifth, games of chance and the sale of intoxicating drinks are prohibited. These with many other advantages insure old Geauga each year a good fair.

GREENE COUNTY.

Our County Fair held last September was a good one, notwithstanding the unfavorable weather during the first two days thereof. The show in most all classes was good, that in the fine arts, needle-work, etc., the best ever shown in this county. The amount in premiums offered and paid, being larger than ever before, yet the Society came out a little ahead, and are in good shape for another and better fair in September, 1886.

The general geological formation of land in this county is level, sufficiently rolling to insure good drainage. The soil generally is good, strong clay, with enough sand in it to make it easily tilled, the valleys being black, sandy soil; all produces good crops. All kinds of vegetables are grown and produce well. The principal timbers are oak, hickory, ash, maple, and black walnut,

with a great many other kinds, but the foregoing list comprises the bulk of the timber. The stock principally raised here are horses, cattle, sheep and hogs, all of the best breeds predominating.

The farmers have built, and are still building good, substantial dwelling and farm buildings, which will compare favorably with any county in the State.

The principal crops raised are wheat and corn, although a great deal of oats and other small grains are raised in large quantities. The wheat crop of 1885 was a partial failure; but the corn crop is an immense one, and farmers in our county feed most of it to stock, a small proportion only being sold for purposes other than feeding and for shipping to other points. The oat crop was a fair average one, as was also the crop of hay, of which an immense amount is annually cut in this county.

The improvement in the stock and breeds of horses, cattle, sheep and hogs, more especially in the three former, is noticeable each year, all of the poorer qualities being weeded out each year and replaced by the very best that can be found in this county or by importation from foreign countries, and especially so as to horses. To day our county cannot be surpassed for fine horses, both for roadster and farm-purposes.

The common schools of our county have, by constant attention of the proper officers, been brought up to a high state of perfection, and better buildings are each year taking the place of the old ones, our county being one of the foremost, of its class, as to both schools and churches. Splendid farms and well educated farmers who farm them intelligently.

The farmers' club and institute of this county have been of great advantage to the farmer, which is fully shown by the improved methods in handling stock and grain, while at the same time these meetings give them a better opportunity to get acquainted with each other, and the study and discussion of the best manner to till the soil, and all kindred farm topics, make these meetings exceedingly interesting as well as profitable.

GUERNSEY COUNTY.

The Eighth Annual Fair of the Guernsey County Farmers' and Mechanics' Industrial Association was held at Washington, Ohio, September 30th and October 1st and 2d.

The horse department was well filled, there being one hundred and twenty-one entries in the several departments, and quite a number of thoroughbreds being among them.

The cattle show was the largest ever at the fair. There were more entries of Shorthorns than of any other breed; also had two herds of Jerseys. The sheep and swine departments were also well filled; and in fact, we never had a larger or better show of stock in the county. The premiums amounted to considerable more than ever before.

The poultry display was "grand," as we heard it expressed frequently. Our Board has not offered very large premiums for fast horses, but have always had some amusements for the benefit of the patrons of the fair. This year we hired all the bands in the county for the last day of the fair. Eight bands were present, and we can say, without fear of contradiction, that it was appreciated by all. And we never saw people more generally pleased. We have had balloon ascensions, bicycle races, etc., at our previous fairs, but we say, that this was the best "drawing card," if we may be permitted to use the ex-

pression, we have had, as the bands were located in all sections of the county, which brought the crowd.

Fine art hall was filled to its utmost capacity. The display of agricultural products was immense, and fruits of all kinds were on exhibition. The display of flowers, canned fruits, etc., was the admiration of all; and in fact, the display was the best ever known in the county.

The general surface of the county is hilly, interspersed with fine valleys. The soil is of sand and limestone, and has plenty of timber; it is well watered, and as nice a fruit county as there is in Ohio. Wheat, corn, and oats are the principal grains raised. Sheep is the principal stock raised, while we have several herds of Shorthorns, Jerseys, and one herd of Holsteins. Our farmers are industrious, and most all are taking agricultural papers. Quite a number of fine farm buildings have been erected during the past season, and tile drainage has become the most important factor to produce good crops in many sections of our county. It is almost unnecessary for us to say anything about our churches and school-houses, as we cannot be excelled by any county in the State. There are two Grange stores in the county, but we cannot say as to their financial success.

We would say in conclusion, that all are taking more interest in a county fair; and, although Guernsey has not been recognized by the State Board for a number of years, yet we venture the assertion that no county in the State has had better fairs and better pleased patrons than we, and that in the future, with her large coal fields, her registered sheep, and her thoroughbred horses and cattle, she will be second to no county in the State.

HAMILTON COUNTY.

The year 1885 was an unusually successful one from an agricultural standpoint. All the crops usually raised here were above the average. The fruit crop, especially that of apples, was abundant.

The Thirtieth Annual Fair, held August 25th-29th, was a decided success in every respect. The attendance was the largest of any fair held since the late civil war. The display in the horse and cattle departments, both in numbers of exhibits and high grade of stock, far exceeded that of any previous fair in the history of the Society.

Through the kindness of the County Commissioners, our Society boasts of having the finest and fastest half-mile track in the State of Ohio. It was built during the season, regardless of labor and expense.

HANCOCK COUNTY.

Our annual exhibitions have been increasing in interest and favor for some years past; each succeeding one being better than its predecessor, and the thirty-fourth was no exception, being the largest and most attractive of any within the history of the Society.

The entries of articles for exhibition outnumbered those of any other by more than five hundred, and if possible the articles entered were an improvement on all former efforts.

The exhibition of stock was, as usual, full, and one of the principal attractions, that of horses, could hardly be surpassed. Our farmers have learned that it costs no more to rear a good animal than it does a poor one, and that

the difference in the profits is an inducement to breed none but the best; and while they are not blind to the merits of roadsters, and even *fast horses*, yet the hardy, substantial draft horses—such as are needed on our heavy roads, demand the greater attention, and the very best of these breeds are being sought after.

In cattle, the Shorthorns still keep the lead, but the Jerseys, Devons, and Holsteins have each their friends, and bid fair to become quite common, and a source of profit to those who handle them.

Fine wool sheep are almost the only kind bred. There are a few flocks of long wools. The sheep interest has very materially declined in the past few years, by reason of the low price of wool, and the ravages of dogs, yet our wool men made a very creditable show at our last fair.

We have both the large and small breeds of swine, but the large breeds generally predominate. Our county has been visited the past year by that terrible scourge—the hog cholera, and hundreds of hogs have perished, the farmers in some parts of the county losing their entire stock.

The poultry trade is gradually increasing, and much more attention is paid to breeding than in times past. Our farmers are beginning to appreciate the importance of this product.

Our principal grain crops are wheat and corn. This year an immense oat crop was also produced. Our wheat crop would average perhaps twenty bushels to the acre. Corn was not a full average crop, yet much of it was of the best quality. Clover seed, on account of the hot, dry weather in its season, was almost a failure.

There was a very heavy crop of grass, and hay was more than usually abundant. Vegetables, except potatoes, were abundant and of good quality. The potato crop was almost a total failure in many parts of the county, and yet our exhibition contained some fine specimens.

The fruit crop has long since ceased to be of any practical value or importance in our county. Successive failures have diverted attention from it, and consumers expect to get from importers what they may need.

Berries are quite abundant and of good quality, and their cultivation is becoming quite an industry in our midst.

The ladies, as usual, contributed their full share towards the beauty and success of the exhibition, by bringing such specimens of their handiwork as fully attested their skill in all that pertains to housewifery.

The farms are being handsomely improved, and new ones are being opened up, and the farming interest is in a healthy and prosperous condition. True, there is some complaint about the cheapness of farm products by those who have them to sell, but the fact of this cheapness is an indication of the fruitfulness of the earth and the industry of the husbandmen.

The Board of Directors of our Society—all honorable, intelligent men, a majority of whom are farmers—have labored in harmony, and for the interests of the Society. They have added by purchase five acres of valuable lands to our already ample grounds, now more than *forty acres* of most beautiful, conveniently located lands. Some new buildings have been erected and many conveniences added.

Our registered membership is four hundred and ten. I know of no reason why we should not make further progress, and we certainly have every encouragement to do so, and I think our prospects were never better.

The discovery of vast deposits of gas and oil in our county will, of course, affect the farming interests, but to what extent and in what manner is yet an unsolved problem. The use of gas for heating purposes will have the effect perhaps of preserving our forests, and thereby work a benefit to the farmer.

True, it cuts off to some extent his income from that source. The almost certain building up of manufacturing interests by the cheap fuel here offered will increase the number of consumers of produce, and thereby, of course, benefit the producer. An increased number of manufactories will certainly stimulate greater production and make a ready home market, and thus inure to the profit of the farmer. But should oil be developed in abundance, it would most certainly demoralize the farmer and farming interests. Our people are not different from those of other localities, where these things have been found, and a spirit of speculation would no doubt lay hold of them, and every other thought except that of speedy wealth would be lost sight of, and a farm would only be thought valuable by the amount of gas and oil it might produce.

HARDIN COUNTY.

The annual exhibition of the Hardin County Agricultural Society was held on its grounds, south of the city of Kenton, Ohio, on the 8th, 9th, 10th, 11th, and 12th of September, 1885. The first and second days of the fair were a failure, on account of continuous rainfall, but the third and fourth days the attendance was large, and the fair was continued one day longer than was advertised in the catalogue.

Our fair ground is one of the most beautiful and convenient in this part of Ohio, and the buildings on it are substantial and well arranged.

The soil of Hardin county is good, and, as a rule, it is well cultivated. Our farmers are prosperous. To be convinced of this, one has only to ride through the county and observe the well-fenced farms, adorned with comfortable and attractive homes, and large, spacious barns; the fine breeds of hogs, sheep, cattle, and horses; the neat churches and school-houses with their doors open to all. No one can visit Hardin county and examine into its natural resources and prosperity without being convinced that it is soon to rank high among the best counties of the State. All its principal roads are piked, and many miles of pike are building every year.

The corn and wheat crops of this county this year were good; also the potato crop; but the apple crop was almost a failure.

Our fair was held a month earlier this year than usual, and for some reasons it is better to hold it early. The display of fine horses and cattle was grand; also, that of sheep and hogs was good. The halls were not so well filled as on previous years, but the display was fair. The exhibit in the poultry department was better than for years. The fine art department was well filled, and some of the articles on exhibition were especially fine.

The timber of this county, though abundant and of the finest quality, consisting of walnut, hickory, oak, and ash, is fast disappearing before the ax and plow.

The Scioto and Hog Creek marshes, which lie in the western and north-western parts of the county, are becoming well drained, and can now be cultivated in many places with profit, thousands of bushels of potatoes being raised thereon every year.

Four of the leading railroads of the country pass through this county.

This county takes a high rank in education. Its teachers are well drilled, and do thorough work. The Northwestern Ohio Normal University, at Ada, this county, is growing to be one of the leading educational institutions of Northwestern Ohio, having an average attendance of at least a thousand students.

We are proud of our county, and thank God that we live in a county rich

and productive, whose people are energetic and enterprising, and advocate good order and decency, encourage education, and carry into their daily life those principles of morality and rebellion which will elevate the standard of society and merit the blessings of heaven.

HARRISON COUNTY.

Harrison county is situated in the second tier of counties from the Ohio river. Is 133 miles by rail from Columbus, and 33 miles from Steubenville. This county is divided into fifteen townships, named as follows: (Commencing at the south-east corner). Shortcreek, Green, German, Athens, Cadiz, Archer, Rumley, Moorefield, Nottingham, Stock, North, Freeport, Washington, Franklin and Monroe. The county is composed of 405 sections of land. The P., C. & St. L. R. R. passes through the townships of German, Rumley, North and Monroe. The Wheeling and Lorain R. R. passes through the townships of Washington, Freeport and Moorefield. The Wheeling and Lake Erie R. R. connects with the Pan-Handle R. R. at Bowerstown, in Monroe county. We also have a branch road from the Pan-Handle R. R. to Cadiz. This branch starts from the Pan-Handle R. R., east of the dividing ridge, ascends the hill at a heavy grade to the top of the ridge, then follows the ridge to Cadiz, a distance of eight miles. This leaves our county without very bad railroad facilities. The geological formation of our county was given last year about as well as I can now give it, yet I will reproduce it. There is a dividing ridge passing through our county, north and south. No stream of water crosses this ridge in the county. No railroad can be constructed through the county, east and west, without piercing this ridge with a tunnel. To make a good road the tunnel would be from 1,600 to 1,800 feet. The streams on the west or the ridge are all tributaries of Stillwater, and empty into the Tuscarawas river. The streams rising on the east of the ridge are the Wheeling creek waters, Shortcreek waters and Crosscreek waters—all emptying into the Ohio river. The formation of this county is generally hilly, with some level land along the valleys. The soil is generally limestone, underlaid with good stone coal, the thickness of which is from $4\frac{1}{2}$ to 6 feet. A variety of kinds of timber grow in our county, among which are all the different kinds of oak, poplar, black walnut, white walnut, hickory, white ash, hoop ash, wild cherry, locust, beech, sugar tree, maple, linden, chestnut, dogwood, ironwood, etc. Our farms, as a rule, are small. They are farmed principally by their owners. Our county lying so much above the level of the lakes, it is partially free from early frost. About all the leading fruits of the State are raised here. Almost all kinds of grain can be successfully raised in our county, especially wheat and corn. Corn, however, we regard as the leading crop. Vegetables of all kinds can be very successfully raised, but the leading one is the potato, and of these we have all the leading varieties. Harrison is also a good stock raising county. The kind of stock raised in the county, can not be better described than it was in last year's report, hence I quote part of that report, "our sheep are sought after in other counties and States, and our wools are sought after by eastern manufacturers." As to quantity of wool, we stand first. A great many good horses are raised in the county, of different kinds, from the fine saddle and driving horse to the heavy draft horse. For the last two or three years, a great many fine horses have been brought into the county, more than has heretofore been for the same length of time. These different kinds of horses have been sought after by Eastern buyers. This county is also good as a cattle-growing county. We have all the different breeds of cattle—Short-

horns, Jerseys, Holsteins, etc. From these thoroughbreds we obtain a grade that sells well in the market.

The hogs raised in this county are of the following varieties: Berkshires, Chester Whites, and Poland-Chinas. Each class has its favorites.

Our style of farming will compare favorably with other counties. We adopt all, or nearly all, the late improvements in farm implements. Our buildings and improvements generally are of a good character. Tile is now being used by a great many farmers of the county, and to a very good advantage. Land that was almost worthless in its swampy condition has been so improved by tiling that very good corn crops can be raised on the lands.

Now, persons who may desire to make our county their future home need have no hesitation in coming, as they will find good soil, good society, both social, intellectual, and moral, with a very good temperance sentiment prevailing throughout the county, good schools, churches of nearly all denominations in nearly every settlement.

We will now say something in regard to the last fair. The Thirty-eighth Annual Exhibition of the Harrison County Agricultural Society was held October 6th, 7th, 8th, and 9th, 1885. The weather was good throughout; attendance on the first and second days light; third, moderate; fourth, very good, equal to any day for several years past. The exhibition in all the departments was very good. Floral hall still had its many attractions, and there was a fine display of horses, cattle, sheep, hogs, poultry, machinery, etc. On the third and fourth days the premium stock and machinery was exhibited on the ring, which was very attractive.

We will just say in conclusion, that we were well satisfied with the exhibition in the several departments, and feel that, with good weather, and a proper management by the officers of the Society, our fair still has a prosperous future.

HENRY COUNTY.

This Fair Company has already held two successful exhibitions, and the fair of 1886 bids fair to be the best in Northwestern Ohio. The fair grounds, comprising 36 acres of land, are situated one-half mile south of the court-house and within the corporate limits of the beautiful village of Napoleon, Ohio. About \$8,000 have been expended in improving the grounds, which are rendered attractive by fine shade trees, exhibition halls, stock stalls and a fine one-half mile track.

The country of Henry county is generally level. The soil is sandy with clay sub-soil and some gravel. The timber is oak, walnut, ash, hickory, sugar, yellow poplar, elm, etc., in short all kinds that grow in Ohio. This county is one of the best in the State for fruits. Apple and pear crop are excellent, and small fruits very abundant. Here, however, the peach winter kills, and the plum and cherry are only fair. The grains are wheat, corn, rye, oats, barley and *Bohemian oats (till you can't rest)*.

Farm Stock.—Horses, cattle, hogs and poultry are largely raised, and sheep to some extent.

The style of farming is fair to middling. The condition of society good; churches and schools are plenty; granges are scattering. On the whole, agriculture has been a success this past year. Wheat has averaged about 16 bushels per acre, with a large acreage. The corn crop has been large, but part of the corn has not matured. The crop of vegetables is good, that of fruits ordinary.

Tile draining is being extensively done all over the northwestern part of the State, and this county is doing her share of it.

Our farm buildings will compare with any in the State. We have now four long lines of railroad running through the county. This county shows wonderful improvement in the last ten years, but even now not over one third of the land of the county is under cultivation.

HIGHLAND COUNTY.

Highland county is situated in the southwestern part of Ohio. A portion of the county is hilly; the remainder being rolling and flat. There is much fertile soil, especially the bottom lands along the numerous streams, which produce fine crops of all kinds.

Hillsboro, the county seat, is a beautifully located town, almost in the center of the county, being on one of the high points. It is noted for its fine schools, good churches, and handsome business and dwelling houses.

The fair grounds, controlled by the Highland Agricultural Society, are situated within the corporate limits of Hillsboro, and are among the finest grounds in Southern Ohio. Two large amphi theatres, from which a good view of as good a half mile track as there is in Ohio, can be obtained. The fair is always held the first week of August, and is the first fall fair in the State.

The displays in the stock departments this year were the best ever seen upon the grounds. In the speed ring especially there were many very fine horses.

The display of Shorthorn cattle and fine sheep was excellent. The fair being held so early, there was not a large amount of agricultural productions, though some departments were well represented. The weather was beautiful, excepting on the last day a heavy rain fell, seriously interfering with that day's attendance, and as a consequence, the receipts were not sufficient to meet the expenditures.

CROPS.

Wheat.—The wheat crop was, on an average, very short last harvest, though some farmers report very good crops, while others did not get their seed. The quality was excellent.

Oats.—Oats was the best crop for years, and was an increased acreage.

Rye and Barley.—None of consequence raised.

Hay.—An average crop, and of fine quality.

Corn.—Corn was an excellent crop, perhaps the best raised in ten years, some farmers reporting yields beyond precedence. The fall being a good one for work, the crop was cribbed early; quality good.

FRUITS.

Apples.—Plenty in localities, but no great crop on an average.

Peaches.—None.

Plums.—About half a crop.

Pears.—A good crop.

SMALL FRUITS.

Strawberries.—In abundance, and of good quality.

Raspberries.—Plentiful, but not of best quality.

Blackberries.—Not plentiful, and of poor quality generally.

Our stock raisers are gradually improving the breeds of stock, especially is

this noticeable in the horses entered in the different departments at the fair. The people are beginning to recognize the fact that a well bred horse that is a good driver is just as easy to raise, and more easy to keep, than a plug.

For the first time in the history of this Society, some of the purses in the speed ring paid the total in entrance fees, and although more money was offered in the speed ring, less money was actually paid by the Society in proportion than in any other department. We believe this is partly attributable to belonging to the National Trotting Association, and also to the uniting of a number of the societies in Southern Ohio in a circuit. The Southern Ohio Fair Circuit was organized in February, 1885, and it is intended to make it a permanent organization hereafter. Our experience teaches us to advise the formation of fair circuits all over the State.

HOCKING COUNTY.

The Thirty-second Annual Fair of the Society was held at Logan, September 17th, 18th, and 19th, 1885. The exhibition of poultry was good, but in all other departments there was a poor showing. This county has been in an uproar for the past eighteen months, on account of the strike among the miners. The wheat crop was almost a total failure, but corn and oats were good. There is not much hope of having a good fair in this county until there is a larger ground secured, and there are no funds on hand to buy one with. The most of the farmers in this county keep in the tracks of their ancestors, and take no pains to improve their stock.

HOLMES COUNTY, 1884-85.

[The report for 1884 was overlooked last year, and hence, is embodied with and made a part report of report for 1885.]

The Holmes County Agricultural Society does not own grounds, but rents from the "Duncan" heirs, the grounds joining the corporation of Millersburg on the south, known as the "Duncan Fair Grounds." During the past year the officers of our Society leased the above named grounds for a period of ten years at a rental of two hundred dollars (\$200) per annum. The location is very desirable, being just outside the corporate limits of our county seat; easy of access, with a broad avenue leading directly to it from the public square. There is an excellent one-half mile track on the grounds, which is voted by horsemen to be one of the very best in the State. The managers of the Society have given much time and attention personally toward the improvement of the grounds, as shown by the many substantial changes thereon. During the last year a new board fence was built almost around the entire grounds, using new chestnut posts, eight feet in length and ten inches in diameter at the base. The old mechanical hall was torn down, and a very desirable building erected in its stead, which was used for a floral hall, the old floral hall being used for a mechanical hall. All of the old buildings, including the stalls, were repaired, and many new stalls were built to satisfy the demands of the exhibitors. With a new mechanical hall, which it is the intention of the Society to build the coming year, and some additional stable room to accommodate the increasing demand of our thoroughbred horsemen, the buildings on our fair grounds will be ample for twenty years hence.

The rules of our Society prohibit the sale of all kinds of intoxicating drinks,

not only upon the grounds of the Society, but upon all the avenues leading thereto; and during our last fair we had no difficulty whatever in enforcing our rules. Thus, our people, when meeting to the number of six thousand, which we had on our grounds during the third day of our fair, they are not insulted nor annoyed by the boisterous ruffianism and brawling profanity incident to intoxication.

The Twentieth Annual Fair of the county was held on the grounds leased by the Society on September 30th, October 1st, 2d, and 3d, with a success that made glad the hearts of the managers. The first and second days of the fair were not profitable, owing to the inclemency of the weather, but on the third day the gate receipts were equal to any in the history of the county. The fair was a grand success, and all parties were well pleased.

The entries in every department were fully up to expectations, and the stock, farm products, and articles generally on exhibition were of excellent quality and not excelled by any former exhibitions.

This is purely an agricultural county, and we are pleased to note that, during the past year, the arduous labors of the agriculturists have been rewarded with an abundant harvest, crops of all kinds making a good yield, both in quantity and quality.

The wheat grown in this county is of a superior quality, and is much sought after by our merchant millers.

Our apple crop was much more than ordinary, and in quality equal to any grown in the country.

Our exhibitors of fruit, of which honorable mention should be made of G. F. Newton, Daniel Duer, Mr. Finny, Mr. Uhl, and many others, almost invariably carry off first prizes where they exhibit. Mr. Daniel Duer, one of our leading fruit men, is a large exhibitor of apples at the World's Exposition at New Orleans, at the present time, and his friends indulge the hope that he will return with the major part of the premiums.

Sheep husbandry is carried on quite largely in this county, and our farmers felt very keenly the shock that industry received through recent adverse legislation, and at present there are many indications of neglect in that branch of agriculture.

The raising of thoroughbred stock—horses and cattle—is rapidly growing in favor with our farmers. We have a goodly number of Jersey cattle in the county, the leading herd being owned by Dr. J. G. Bigham, who is the pioneer in that line, while John E. Koch, and many others, are engaged in the breeding of thoroughbred Short Horns. In heavy draft horses, however, we are making our most rapid strides, until we feel that we can challenge any county in Ohio in the number and character of that class of horses, they being good representatives of the firm, reliable, and increasing interests of the agriculture of our county. The decided improvement in the domestic animals of our county is, no doubt, largely due to the existence and influence of the agricultural society. The annual exhibition at the fairs of the best improved animals is an incentive to our farmers to procure and raise only the best stock. To illustrate, at our last fair, when a certain farmer was asked how he was pleased, he replied, "I am satisfied, although my neighbor beat me on hogs; but I will down him next year."

The first incident worthy of note in 1885, was the Farmers' Institute which took place in January, and was inaugurated by the board of managers, and held under the auspices of the society. As it was the first held in the county, the programme being good and the speakers gentlemen of State notoriety, the result was a crowded house each day and night. Mr. Chamberlain's lecture, "The Boy in Town and Country," delivered on the evening of the first day,

was pronounced, by those whose pleasure it was to be present, a rare literary treat. A great many subjects of much interest to our farmers were discussed, in which many of our country people participated. The Farmers' Institute has grown in favor in our county until now the people demand them every year.

At the annual election of officers, the old board was continued, with a few exceptions. This was a well-merited recognition, as the officers and managers, during the past year, labored industriously and intelligently to place the society on a good basis, and that they succeeded is admitted by every citizen of the county.

Through the skillful management of the board "Arbor day" was observed by the planting of tree on the fair grounds, the trees being furnished gratuitously by the farmers. The school children, numbering some 450 under the supervision of our worthy Superintendent, Prof. J. A. McDowell and his corps of able teachers, participated in the exercises, and rendered the occasion very enjoyable indeed. The trees planted are growing beautifully, and will in a few years make a lovely grove.

The Society expended during the year in the improvement of the grounds and putting up new buildings, \$850, and can now boast of as well regulated and as complete fair grounds as there is in the State.

The wheat crop in this county was almost a total failure owing to the severity of the winter, many farmers not reaping as much as they had sown. The loss to the county in the failure of this crop is estimated to be at least \$500,000. Other crops, such as corn, oats and potatoes did fairly well.

Our fruit of which we grow a superior article, excelling in the quality of our apples every other county in the State, was fully up to the average in quantity. Our Mr. Daniel Duer who is noted for almost invariably carrying off first honors at our State fairs, sent samples of his apples to the Exposition at New Orleans, and in accordance with his custom, and the eternal fitness of things, received three prizes, amounting in the aggregate to nearly \$100, he being the only exhibitor of fruit from Ohio that elicited such recognition.

The Twenty first Annual Fair was held on the grounds of the Society, September 29, 30 and October 1 and 2, and was a grand success financially and otherwise. In the number of persons present, the general conduct of the large crowd, the receipts, and in the general satisfaction expressed by exhibitors, the last fair has never been excelled in this county.

Thoroughbred stock is receiving much more attention from our farmers than in former years. In cattle the Holstein is rapidly growing in favor. Mr. Allen Garrett, of Kipley township, had on exhibition a very attractive herd. In Shorthorns, Peter Snyder, of Saltcreek township, excelled all competitors, his herd equalling anything ever seen at our State fairs. Messrs. John E. Koch, Ed. Day and Douglas White are largely interested in Shorthorns, and their herds were universally admired. Our county is noted for its heavy horses, and the Sharp Brothers justly rank amongst the foremost as dealers in and breeders of thoroughbred draft. Monroe township is noted for its fine wools, and it owes its distinction largely to the Andersons, Birds and Allison's. This township, in my opinion, produces more fine, high grade wools than any other township in the State.

The exhibit of poultry at our fair was beyond all expectation, that of John Yoder being specially attractive. Mr. Yoder is the leading spirit in the county in this line, and that he fully understands his business was evidenced by the very interesting paper he gave on the subject at our institute. The hog is also well looked after, the many breeds receiving the attention of our people. Amongst the foremost swine-breeders in the county are James Pyers, of Monroe township and Fred. Kalb, of Hardy.

HURON COUNTY.

April 7, A.D. 1788, forty-eight men began the settlement of Ohio at Marietta, and from this beginning, within the lifetime of man, the wonderful development has succeeded, greatly owing to the productiveness of soil and energy of agriculturists.

Experience shows that the culture of lands and the breeding of stock, which is a consequence and necessary part of it, has always been a certain and inexhaustible source of wealth and abundance. Agriculture is an art that requires study, reflection, and rules; of trying experiments, and of uniting theory with experience, and followed in consequence of our pleasure in it.

As to production, Huron county for the past year has been successful, but prices are far from satisfactory, with perhaps the single exception of potatoes, of which a large quantity are produced. Upon our sandy soil there is no crop that pays the farmer so well for his labor.

Wheat was a fair yield and of good quality, but at about ninety cents per bushel, it is only with the assistance of the best labor saving machinery that it can be made a paying crop.

The oats crop was good, but I think it only a crop of convenience.

The acreage of corn was large, and the yield good. It is mostly consumed in the county.

These—wheat, oats, corn, and potatoes, with grass, are the principal crops of our county, only a small amount of barley, rye, flax, and buckwheat being produced.

Tile yards are well patronized. Even our sandy soil being improved by under-draining.

Commercial fertilizers are being used to an increasing extent each year.

For many years this county has been noted for its fine stock, and especially so as to cattle, sheep, and hogs; and this year they were all willing and anxious to exhibit.

Our cattle show was almost equal to the State Fair. In fact, in some classes we had more entries than they. We thought we were amply provided with stalls, but on the first and second days of the fair added about one hundred, and then had cattle tied to posts and trees, and accommodated off of the ground. The pens and yards were full of hogs of excellent quality. The sheep equally numerous and fine. Last year we had more horses than we could accommodate. This year the display was good, but not so large, for horsemen always expect strong competition at our fair, as there are a large number of imported horses in this county.

The agricultural fair is a fixed fact. This, A. D. 1885, is the thirty first annual for Huron county, and each year there is an improvement in almost all departments, and with honest and energetic management they can be made self-supporting, and an institution of uncalculable benefit to the country. The one subject of *taxation*, I think, is of more vital interest to the agriculturist than tariff on wool and oleomargarine manufacture put together. By reference to Secretary Chamberlain's lecture, Agricultural Report, 1884, pages 535-546, you will see that agriculturists pay seventy two per cent. of the entire tax of the country; they pay within one per cent. of half the taxes on personal property, while on the other side are the great railroad corporations, manufacturers, banks, merchants, and all other classes of personal property, and still they are not satisfied.

JEFFERSON COUNTY.

Jefferson county is one of the eastern counties of the State, and stretches along the Ohio River a distance of about forty miles. The surface is quite undulating and hilly, but not rough and rocky to such an extent as to seriously interfere with the agricultural interests of the county. Being undulating it is well adapted to grazing as well as to grain raising. The soil is mostly limestone in quality, and is very productive. Coal and limestone abound in almost inexhaustible quantities, and are generally easily obtained. There are several natural gas wells in the county, at different points along the river. Gas is usually found at a depth from twelve to fifteen hundred feet. This being one of the first settled counties, the land is mostly in a state of cultivation; however, about ten or twelve per cent. yet remains in timber. The timber consists of oak, walnut, sugar tree, hickory, ash, etc., and is mostly of a superior quality. As a rule, the society is not excelled by that in any county in the State. Education is universally diffused among all classes. The cause of religion is also well attended to, almost all the different denominations having many adherents.

The farms generally are in a good state of cultivation and well improved, with large, commodious dwellings and all necessary out-buildings. Farms sell at from fifty to one hundred and twenty five dollars per acre, according to quality, improvements, and location.

The principal grains grown are wheat, oats, corn, rye and barley, the two latter, however, not being cultivated very extensively. In that part of the county near the Ohio River vegetables are cultivated extensively.

Apples, pears, peaches, and plums are grown to a considerable extent, especially the former.

This is one of the principal wool-growing counties, and more attention is devoted to the raising of sheep than of any other stock; yet quite a number of horses, cattle, and hogs are also raised. The American Merinos still hold the lead, but many farmers are now breeding the Blacktops, believing that they are more healthy, and not so apt to be afflicted with the foot-rot.

Shorthorn cattle are bred most extensively; still there are a good many Jerseys, and a few heads of Ayrshires and Holsteins.

Live stock of all kinds has prospered well during the past year, and no disease of any kind has prevailed.

The wheat crop was very light, being badly injured by the incessant freezing of the past winter. Many fields are plowed up and sowed in oats, or planted in corn.

The crop of oats was unusually good, the yield being excellent, and the grain of a superior quality.

The corn crop also was very large, being the largest raised for several years. Although the crop was a little late, yet the greater portion of it matured finely.

Barley and rye were also good. The hay crop was only fair, and potatoes quite light. Apples and pears quite abundant, but peaches almost an entire failure.

The annual exhibition of the Society was held on the grounds, near Smithfield, September 23d, 24th, and 25th. The weather was fair, and the attendance equaled that of former years. The display in almost all departments was larger than at any previous fair. This large exhibit necessarily required more money than usual to pay the premiums; yet the receipts were amply sufficient to pay all expenses and premiums in full. The Society is now in a flourishing condition, and if judiciously managed in the future, as it has been in the past, bids fair to remain so for years to come.

LAKE COUNTY.

Lake County Agricultural Society held its Thirty-third Annual Fair September 22, 23, 24 and 25. The plowing match which has usually been held on the first day was given up this year, and that day devoted entirely to making entries.

Our fair grounds have been greatly improved during the year. Four acres of land have been purchased and thoroughly underdrained; a new hall, 80x60 feet, built for domestic manufactures; the track has been improved and made a full half mile; sixty rods of sheds built, making in all over one hundred rods, and an amphitheater with a seating capacity of 700 has been erected.

The second and third days were devoted to the exhibition of horses and cattle in the small ring, and the awarding of premiums in all the departments. All stock remains on the grounds two days, and horses and cattle are shown in the small ring, which adds greatly to the interest of spectators.

Notwithstanding our additional room, the allotted space for each class was more than filled.

The show of horses, cattle, sheep and hogs was very good indeed, and the entries in most classes exceeded those of other years. In other departments the exhibit was good; but smaller than some years in farm implements and also in poultry. One very noticeable feature was the entire lack of peaches which, perhaps, never occurred before.

The fourth day was devoted entirely to trials of speed. The attendance was very large, which is indicative of the interest taken in fine horses.

Lake county was so fully reported last year, and years previous in regard to its geology, soil, timber, fruits, grains, etc., that it seems unnecessary to report it again this year.

The condition of agriculture for the past year has been generally successful, with perhaps a few exceptions. The season has been unfavorable for the cultivation and harvesting of crops and the markets for nearly every farm product have been so low that farmers are a little discouraged. If, however, the attendance at our fair is any indication, the interest in agriculture is rapidly increasing.

The members of the Society increased from 669 last year to 942 this year, and the attendance, receipts and premiums paid being in excess of any previous year.

The farmers' institutes also are better attended from year to year. The social and moral standing of the county as indicated by the schools and churches is excellent.

LAWRENCE COUNTY.

The crops averaged about as follows: Wheat, 20 per cent.; corn, 125 per cent.; hay, 50 per cent.; potatoes, 80 per cent.; vegetables, 100 per cent.; fruit, 75 per cent.; oats, 125 per cent., and sorghum, 150 per cent.

The surface of the county is three-fourths hilly and one-fourth level. The soil is of various kinds, but principally red and white clay and sandy soils. The timber is of all the usual varieties for this latitude.

The principal grain crops are corn, wheat and oats. The fruits are apples, pears, plums and peaches. The vegetables are Irish and sweet potatoes, onions and garden truck.

Improvements are constantly being made in the breeds of horses, cattle, sheep and swine.

County roads, farm buildings and machinery are all good. Within the county we have three farmers' clubs and one grange.

The display at our County Fair was better than ever before, rivaling in fruits the State fair.

Fertilizers, tiling, rotation of crops, tree planting and grassing of land are being resorted to with satisfactory results. Local markets are good, but not equal to those of former years.

LICKING COUNTY.

The Licking County Fair for 1885 was a success, considering the fact that the year was a bad one for fairs. The attendance was large, but was not equal to that of the year 1884. Great interest was manifested by exhibitors, there being 2,732 entries made in the various departments. The Board of Directors, however, did not realize enough to pay the premiums and to discharge the liabilities of the Society. It became necessary to borrow money for that purpose.

Over fifty years ago the Society was organized, and from that time to the present the charge for admission at the gate has been twenty-five cents for each person. The premium list has been continually increased until now six thousand dollars are awarded to exhibitors. The expenses of managing a first-class fair have also increased over the expenditures necessary to conduct the fair when it was not so pretentious. The facts suggest a conflict of interest between two patrons of the fair, namely: between the exhibitors and the mere spectators. The premium list must either be reduced at the expense of the former, or the source of revenue must be expanded by a larger charge at the gate. The Board have had this serious matter under consideration, but have met with no encouragement from the two classes named. The exhibitors insist that the awards shall not only not be decreased but that they shall be increased, while the other class insist that they and their teams shall be admitted to the fair for twenty-five cents only, and also that the younger members of their families shall be admitted free.

Since our last report, Mr. Veach, who was our worthy President for several years, resigned, and Mr. L. B. Wing was elected by the Board of Directors as President for the unexpired term. Mr. Wing is well and favorably known to the State Board, having been its President, and report says that he was one of the best Presidents it ever had. The Board for the year 1886 consists of the following named Officers and Directors: President, L. B. Wing; Vice-President, James H. Richardson; Treasurer, Wm. Allen Veach (son of the ex President); Secretary, B. G. Smythe. Directors—J. M. Black, A. J. Cada, I. Willis Fulton, Miles Marple, A. P. Stewart, William Hall, Joseph Davis, I. N. McMillen, and Thomas D. Price.

The condition of agriculture in Licking county for the year, like that in her sister counties, was not favorable. The wheat crop did not produce more than enough to replace the seed. The corn crop was not an average yield, producing only about 35 bushels to the acre. The clover crop was almost an entire failure. About fifteen bushels to the acre of rye was produced, which is an average yield. About half a potato crop was produced, and the fruit is not worth speaking of. More can be said, however, about the hay and oats, the former being a fair crop of about two tons to the acre, and the oats crop averaging about fifty bushels to the acre.

LOGAN COUNTY.

The site and topography of Logan county is to well-known to again be written in the annual report of Agriculture. From year to year but little variation occurs in crops, unless occasioned by a very wet season or drought. In presenting this statement of the condition of crops, and advance made in stocking-raising we are able to say that the past year marks considerable advancement.

The spirit of progress manifested in farming communities constantly increases. Farms are becoming fitted up with the most modern improvements. Buildings indicative of taste and convenience are being erected throughout the county, also well painted, commodious barns, stock sheds, and sheds for tools and tools in the sheds when not in use, and fences in good repair. Farmers are beginning to realize that country houses can be made attractive, and a drive through our county reveals to the traveler elegant country homes. Numerous school houses and churches all evidence an intelligent and Christian people.

No exhibition of the agricultural products of this county ever equaled the display made at our last fair. The receipts were greater than ever before. The Board is composed of wide-awake men alive to all advantages that can be secured to the farmer through farmers' institutes, lectures and first-class exhibitions, and have raised the standard of our fair, making it second to no county fair in the State.

In the exhibition of horses the Norman French and Clydesdale predominate as draft horses, receiving the attention of breeders and importers. Stock men are studiously planning by what means they can improve the cattle. Shorthorns are universally admired. The Durham and Holstein taking the lead as beef and shipping cattle; while the Alderneys are everywhere found and command a good price for their butter making qualities. Sheep breeding has been reduced to a science. Any point of excellence desired can be produced by the breeder by careful study of the form and wool qualities of his flock. The question brought before the sheep raisers of our country at present is, Which is most profitable, to raise sheep for wool or mutton? Mutton sheep do not produce the best wool, and unless the wool markets promise the farmer something better, our sheep, Merinos, and Shires and Downs, will find their way to the market for mutton. Ohio cannot be surpassed in production of fine-wool, and Logan county is keeping up her flocks from the best imported.

The old adage, "Root hog or die" is found no more in Logan county's calendar; but every pig is fed from its first day until it meets the butcher. Swine raisers now desire a stock of hogs that can be fattened and put upon the market while young. Poland Chinas and Berkshires are the leading breeds.

The display of poultry was equal to any former year. Both floral and vegetable hall were filled to overflowing. Art hall was simply grand, excellent taste being displayed in arranging articles brought in for exhibition. More space is needed in this hall for the accomodation of the fine arts.

The fruit display consisted chiefly of apples, pears and grapes and was very large.

The agricultural implement department was filled with necessary farm machinery, and was the point of interest for progressive farmers.

The managers of the fair worked like beavers, and have the pleasant consciousness of having achieved a grand success.

LORAIN COUNTY.

The Lorain County Agricultural Society was organized in 1846. Previous to this date, however, shows for stock, etc., had been held both in Elyria and in Oberlin as early as 1833. A stock show was held in what is now the north end of the public park, at Elyria. At this show sixty dollars was awarded as premiums on horses, cattle, and articles of various kinds.

In October, 1845, a fair was held at Oberlin. Dr. N. S. Townshend, then of Elyria, now of Columbus, did more to get farmers and others together to organize a meeting, which eventually resulted in the formation of the present Society, than any other man. On April 29, 1846, a meeting for formation and organization of the present Society was held, on motion of A. H. Redington. It was resolved to proceed at once to form a county Society, in accordance with the rules and regulations of the State Board, after which the first officers of this Society were elected, as follows: Joseph Swift, President; Daniel B. Kinney, Vice President; A. Beebe, Sr., Treasurer; A. H. Reddington, Secretary; Henry Tracy, George Sibley, Edwin Byington, and T. W. Osborn, Directors.

The first fair by the present organization was held at Elyria, September 30, 1846. Premiums to the amount of one hundred and seventeen dollars were awarded. The second one, held the year following, increased the awards to one hundred and thirty-five dollars. The third and fourth annual fairs were held at Elyria, and are reported to have met with success. The fifth, held in Oberlin, in 1850, offered higher premiums. The next, the sixth, held at Wellington in 1851, cleared two dollars, their receipts from members and the county being \$186, while their expenditures were \$184. The next, held at Elyria, was a great success; the premium list was extended and stock was classified. The ladies exhibited a long list of articles. The eighth, ninth, tenth, and eleventh fairs were all held at Elyria, each year being a little better than the previous one, the eleventh being remarkable for the fact that nearly every premium was competed for. The twelfth was a success, and the thirteenth, held in 1858, proved that the old fair grounds had become too small to accommodate so large a gathering. The fourteenth was a financial success, as enough was made to meet expenses. The fifteenth was well attended, and financially successful also. The sixteenth, with a fast day and a rainy one to contend with, the receipts exceed those of any previous year. In 1862 no fair was held, as things of more importance, the war, had to be cared for. The eighteenth fair gave an excellent show. The last day was fixed for trotting and other amusements, which were first introduced by Mr. D. A. Stocking in 1861. This arrangement was not unanimously desired, and was attended with a great amount of discussion. The nineteenth and twentieth were also good. The twenty-first, held in 1867, was the first held on the present grounds. The twenty-second was largely ahead of any previous exhibition. The twenty-third and twenty-fourth were successful in all departments. The twenty-fifth was a fine exhibition, but was poorly attended, but the one following it, the twenty-sixth, redeemed it by having more entries than ever before. The twenty-seventh, many entries, small attendance on first and second days, but the last days were fine, and saved the Society from loss. The twenty-eighth annual fair, though the exhibition was light, the receipts exceeded those of any previous one, being \$2,410.26. The twenty-ninth was well attended; exhibition a little below the average; receipts, \$2,281.00. The thirtieth being held in the Centennial year, was not a financial success. The thirty-first was a success, so also was the thirty-second, but not so much so as some of its predecessors. The thirty-third and thirty-fourth were both very successful, the last one being of notable interest.

The object of the foregoing article is to show the graded growth and prosperity of the Association from its origin to the present time. The following figures will show the receipts for the past six years :

1880.....	\$2,363 60
1881.....	2,510 93
1882.....	2,460 85
1883.....	3,360 98
1884.....	3 592 35
1885.....	3,771 61

The fortieth fair was the most successful meeting in point of attendance, exhibits, receipts, etc., in the history of the Society. Our fair every year is demonstrating the fact that our farmers are becoming convinced that it pays to breed from first-class stock, and it is safe to say that at least three fourths of the old low grade classes have been supplemented by thoroughbred or high grade stock in all departments.

The total membership of the Association last year (1885) was 384. This is a less number than in some former years, and arises from the fact that a change was made in the number of tickets furnished each member for his membership fee. The annual membership is \$1.50. and entitles members to compete at fair, and also to six tickets, admitting him to grounds; while no change was made in the price of membership, it was found necessary to reduce the number of tickets furnished, for the reason that certain persons made it a business each year to speculate in them. For instance, under the old plan eight twenty-five cent tickets were given for \$1.50. These speculators would purchase, and get others to purchase, large blocks of them, which they would sell for \$2.00, thus cheating the Society out of that sum. The change is universally approved. The attendance was large, taking all the days together, but on the third day was unprecedented. Never before at any fair or any other gathering of people were there so many teams or people gathered in Lorain county. Moderate estimates put the number at *twelve thousand* people.

The proceeds of the exhibition exceeded those of any former year by several hundred dollars, although the first and last days were stormy and unpromising.

It was fortunate that the grounds had been enlarged by about one-half, or no accommodations could have been furnished so large a body of people. As was, everything passed off pleasantly without accident or grumbling.

Extensive and expensive improvements, costing about \$2,000, have been commenced and completed during the year, including barn, stalls for horses, a fence enclosing grounds on two sides, and the construction of wells, which now supply the grounds with water for people and stock.

The following are descriptions of exhibition departments :

Horses —The show in this department was the most complete ever shown in this county, all of the different breeds being well represented.

Cattle.—The show of cattle was grand; the Herefords, Shorthorns, and Jerseys in the lead, with a good showing of Holsteins, Ayrshires, Devons, and grades.

Messrs. J. & C. Savage and J. & H. H. Clough, together with many others, deserve great praise for herds shown.

Sheep.—There are many fine flocks of thoroughbred sheep in the county, which will favorably compare with any in the State.

Swine.—The display of swine was immense, including breeds of Chester Whites, Berkshires, Poland-Chinas, Jersey Reds, and many other good breeds.

Poultry.—The poultry department was filled with very fine fowls, in great variety.

Agricultural Implements.—This department would be hard to excel at any exhibition in the State, and appeared complete in its assortment of implements, wagons, buggies, engines, etc.

Wheat.—The crop was much below that of 1884, the season being wet and cold.

Corn.—The crop was below the average, both in yield and quality.

Oats.—The oat crop was the largest for many years. Very little buckwheat, rye, and barley raised.

Hay.—The crop was very large, but large portions injured by harvesting, the season being wet and rainy.

Clover.—Crop was poor, having failed to seed.

Potatoes.—The potato yield was very light.

Apples.—Apple crop nearly a failure; small fruit very insignificant.

We have a great variety of soil, from clayey to sandy, with some muck; soil suitable for the successful culture of nearly all grains, fruits and vegetables of the temperate zone.

We have a considerable number of manufacturing industries, among them may be named the following line of their products: nuts and bolts, shears, carriage hardware, and carriages, chairs and furniture, scrapers and agricultural implements, tricycles, bricks, etc.

Our close proximity to the prosperous city of Cleveland furnishes a market for all surplus crops and produce of our agriculturists.

Grape growing is extensively engaged in on the lake shore. A fine quality of sandstone may be named among our natural resources. This is so excellent in quality that it is not only sent from one end of the continent to the other, but has been exported. Both for building purposes and for grindstones, it excels, and adds much to the wealth of the county.

Many of our farmers have gone to raising thoroughbred stock, and the variety extends from horses down to poultry, including almost every good breed of horses, cattle, sheep, hogs, etc. Many thousand dollars find their way into this county by the purchase of good stock by western people.

The public and private buildings of the county are such that they are a credit and a pride to its people.

The amount of good reading matter taken by our agriculturist as well as other people is a matter worthy of note, and its good influence to promote intelligence among, not only the present generation but those to follow, is incalculable.

We are blessed with as good educational advantages as the world furnishes; good churches; good markets; good railroad, banking and express facilities, and our people, as a class, are prosperous, happy, healthy and intellectual.

LUCAS COUNTY.

The Lucas County Agricultural Society and the Tri State Fair Association are independent bodies so far as their organization is concerned. The latter body is the out-growth of a sentiment, desirous of utilizing the extensive railroad facilities centering at Toledo, to make a better annual display of the agricultural and mechanical resources of the country tributary to Toledo, than can be done by a single county.

The line between Lucas county and the State of Michigan is less than three miles from the corporation line of the city of Toledo at the nearest point, and a large portion of the southern tier of counties of Michigan is as much tributary

to Toledo as is the Western part of Lucas county, in which county Toledo is situated.

The Tri State Fair Association holds its fairs on the grounds of the Lucas County Agricultural Society, which is leased to them for a term of years, but the lease terminates whenever said association ceases to hold annual fairs. Many of the members of the Agricultural Society are also members of the Tri-State Fair Association. Committees appointed by the former body assist in arranging the premium lists of the latter, and in the agricultural department substantially have charge.

Experience has shown that the present arrangement is mutually beneficial. A much larger and better display is made each year than could be done under the county management proper. The best products in agriculture and manufacture, as well as in the domestic and fine art departments, from a large district, not confined to county lines, are shown each year. Instead of attracting only a few thousand persons to see and study the display which is annually made, at least 50 000 different persons each year visit the grounds and are profited by the opportunities afforded of seeing the best specimens in every department.

The detailed report of the transactions in connection with the annual fair is attached hereto.

In regard to the general matters which the directions of the Secretary of the State Board suggest as desirable to form part of the Annual Report of County Societies we note, that the land in Lucas county is all susceptible of cultivation. A triangle in the northwest part, embracing all of the township of Richfield and part of the townships of Spencer, Swanton, and Sylvania, as well as the southerly part of the county, embracing all of Oregon and Waynesfield townships, and parts of Adams, Monclova, Providence, Springfield and Waterville townships, consists of soil on which was originally a heavy growth of hickory, oak, walnut, elm, ash and other trees requiring the strongest kind of soil. The entire area above described appeared to be almost a dead level, but it has been found that every section of it has from four (4) to ten (10) feet descent, and that every portion of it is susceptible of perfect drainage.

Between these two belts of timber land, extending diagonally across the county is a strip of sandy land from five (5) to six (6) miles wide, whose surface is more uneven than the timber land, but none of which is sufficiently uneven to be called hilly, and all of which can be drained as well as the timber lands.

The city of Toledo, in part, stands on the southerly part of this sandy belt. In the early settlement of the county the timber lands were generally sought after for farms because they would produce large crops of corn, wheat, oats, grass, etc., with little or no fertilizing. Gradually, however, the sandy portions of the county have come into use for farms and gardens, until now many of the more valuable farms of the county are found on land which was formerly considered of little value.

It has been found that these sand farms, with good drainage, and careful and proper use, are especially adapted to the raising of almost every kind of fruit, both orchard and the smaller varieties, and that there is hardly a limit to the growth of all root crops, esculents, etc. in these soils, and that on many of these sand farms general crops are now being produced which compare favorably with the crops raised on the heavier soils.

Nearly all of this sandy soil, within a radius of six to ten miles of Toledo, has been utilized for farms and gardens, and extending through the county are many valuable farms made from these sandy lands. There are, however, many acres of these opening lands, so-called, in the county unused, which can be

purchased at prices varying from ten (10) to twenty (20) dollars per acre, on some of which railroads are located, and none of which exceeds a distance of six (6) miles from a railroad station, and all of which are within twenty-five (25) miles of a city of 70,000 inhabitants.

To persons with some ready means and a willingness to work to make a farm, these lands offer the inducements of good society, good schools and church facilities in the immediate neighborhood, and in the vicinity of a rapidly growing city for a market for the products they are especially adapted to raise.

In the report of one year ago reference was made to the pressing need of better roads in this county. There are now in process of construction three (3) stone or macadam roads leading from the city of Toledo; one southwesterly to the Wood county line; one northeasterly to the Michigan State line, and one leading nearly due west. Another road has been ordered leading nearly east, and the work of stoning it will be commenced in the spring. Petitions have also been filed with the county commissioners asking for the location and construction of several other stone roads. These roads are to be paid for by a charge of one-half the cost of construction on the property abutting or within two miles of the road, and the other half from a tax upon the whole county. It is also provided that after a stone or macadamized road has been made and paid for as above, it shall thereafter be kept in repair at the expense of the county at large, under the direction of the county commissioners who are required to levy a tax annually for that purpose.

The work of drainage in this county continues of paramount interest, both in the making of large, open ditches under county and township direction, and in the use of tile for the benefit of individual farms.

The social enjoyment as well as the intellectual development of the farmers of this county is very largely advanced by the monthly meetings of the Lucas County Horticultural Society. This Society includes many of the best farmers of the county, who with their wives and families meet monthly. A programme is published showing the place, with the topics for discussion, and the essayist for each meeting of the entire year. It includes separate organizations; one for the farmers and their sons, and one, for the wives and daughters. All branches of out door and in door work pass in review. The novice is benefited by the knowledge imparted by those of more experience, while the good cheer provided, and the social opportunities afforded are not the least attractive features of this Society, which, at first, as a township organization, then, a union of two or three townships, and, later, including the whole county, has existed for nearly or quite a score of years.

The list of officers of the Lucas County Agricultural Society for 1885, is as follows, viz.:

S. S. Ketcham, President, Toledo; Wm. Van Fleet, Vice-President, Waterville; E. W. Linderson, Secretary and Treasurer, Toledo.

The balance in the treasury, Dec. 31, 1885, is \$694.18.

MAHONING COUNTY.

The Thirty-ninth Annual Fair of the Mahoning County Agricultural Society was held at the beautiful grounds of the Society, one half mile south of the village of Canfield, on Tuesday, Wednesday, and Thursday, October 6th, 7th, and 8th, 1885. The weather was cold and rainy, which prevented many persons from attending who would undoubtedly have attended if the weather had been propitious. The annual recurrence of the fair of this Society is looked

forward to with eagerness and interest, not only by exhibitors but by visitors, as one of the best and most orderly, if not the very best, in this part of the State.

The number of entries was far ahead of last year, and in fact, of any fair in the history of this Association.

The horse exhibit was particularly fine. The Society this year offered liberal premiums for "standard bred" horses, adopting "Wallace" as authority, and competition was keen between owners of blooded stock in this class. In this departure from the beaten track of "draft," "saddle and carriage," and "all purpose" classes, we believe we are in the vanguard, and the first in the State so to do. We also offered a special class for pure bred Percheron and Clyde draft stallions. Although this was the first year of this plan, and it was necessarily an experiment, it met with good success, and we believe gave satisfaction to exhibitors. All other departments were extraordinarily well filled, with the single exception of Holsteins.

The stock parade on the last day of the fair was a noticeable feature, and the many fine animals participating therein elicited much applause.

As usual, there was no disorder of any kind on the ground, and not a single arrest was made.

"No liquors or beer, and no gambling of any kind" is the rule of this Society, and it is followed by the increasing support of law-abiding people.

Financially, we have no reason to complain. While we cleared nothing, we were able to pay for extensive improvements made, and to pay premiums in full, although the premium list was largely increased.

Of the crops of Mahoning county, little new can be said. All were fair with the exception of wheat, but the State Board has already received detailed reports of all crops.

There was an extraordinary yield of apples of all kinds, but absolutely no peaches. Many peach trees were killed by the extremely cold weather of last winter.

MARION COUNTY.

The Marion County Agricultural Society held its annual fair on the beautiful grounds of the Society adjoining the incorporated village of Marion, Ohio, on September 29th, 30th, and October 1st and 2d, 1885, and it was a complete success, both as to its exhibits and large and appreciative attendance.

The Society, by its enterprise and vigilant care of the wants of its patrons, stand in a very enviable and creditable position. Its grounds are well shaded and supplied with an abundance of water, with large and commodious buildings necessary for the convenience and comfort of both exhibitors and visitors.

Marion county is admirably adapted to mixed farming, having a diversity of soil, and both rolling and level lands, and having four railroads running into and through the county seat makes good and easy access to all the best markets for our surplus products.

Our crops this year were very good, though in some localities oats and corn were injured considerably, and clover seed almost an entire failure from the grasshoppers. Corn was just beginning to silk when the grasshoppers made their appearance, eating off the silk and injuring the corn so it did not fill as well as usual, and stripping the clover fields, so that nothing but the dry stalk was left standing. Potatoes gave a good yield, but of inferior quality.

While our farmers are actively engaged in the cultivation of the soil, they are not neglectful of the raising and management of stock, the improvement of which is greatly marked by the introduction of thoroughbred animals of every kind throughout the county.

The horse ring was well filled at our last fair, there being three hundred and twenty-three entries made in the various classes.

Of cattle, the Shorthorns, by Messrs. J. Hawn & Sons and G. H. Harvey, was a grand show, and the show of Jerseys by J. F. McNeal, P. O. Sharpler, and S. T. Burbauer, while not so extensive as some, was grand in quality; while in grades we don't think Marion county can be beat in the State.

Of sheep, the fine wools predominate.

Chester Whites, Berkshires, and Poland-Chinas are the breed of swine most extensively raised.

There was a good show of poultry.

Vegetable, carriage, and mechanics' hall seemed to vie with each other which should make the best show.

The machinery and farm implements show consisted of nearly every thing in their line of the latest and best improved pattern.

Fine arts, fancy needle work, etc., were nearly complete in every particular, and a splendid show the ladies made in this department.

Although the Society was compelled to borrow eight hundred dollars this season, yet we have the improvements to show for it in a neat and commodious office built for the Secretary, Treasurer, and Board of Managers, new horse stalls, swine pens, and over one hundred rods of tiling put in to drain the grounds.

The exclusion of all games of chance and intoxicating drinks, together with a reputation for fair dealing, morality, and uprightness of purpose, bespeak for this Society a prosperous career in the future.

MEDINA COUNTY.

Medina county has formerly been represented by two agricultural societies, Wayne and Medina Union Society and Medina County Society, but time has demonstrated that two agricultural societies in Medina county are not needed, and the Wayne and Medina Union has ceased to be, and now we have one good prosperous Society, with as good grounds as can be found, on a financial basis that gives assurance to all that what it promises it can and will perform. This is one reason of its continued success. Others have failed because they could not fulfill what they had promised, losing the confidence of the community and its patrons.

Our Fortieth Annual Fair was held on the 15-17 of September, 1885. We had fine weather, a larger number of entries in nearly every class, and a good attendance; and I think nearly all went away satisfied, glad that they were able to again attend the "Farmers' Annual Pic-nic," for such it is.

We had some specialties of rare birds of different varieties of pheasants, shown by W. B. Hinsdale, of Wadsworth, Ohio; also a fine show of fish, Misson carp, by E. C. Blakeslee, of Medina, Ohio; Scale carp, by H. Cutter, of Remson Corners, Ohio. These exhibitions were enjoyed by all.

Our show in horses, cattle, sheep, and hogs, and indeed in all departments gave evidence that we are not going backward. Progress is stamped on all our farms so plainly that no one need be mistaken.

The season has been wet, showing the need of more tile drainage. Crops, generally, were good. We had the heaviest yield of wheat per acre that we have had for years, and it was mostly secured in good condition; although, the harvest being very wet, some was damaged. Oats gave a good yield in quantity, but below the standard in quality; and the greater part of the crop was damaged by excessive rain, making it unfit for the oat-mills. Corn gave

a heavy crop, but did not get dried out, causing considerable to mold in the crib. Flax is not grown extensively, but what there was yielded very well. Clover seed was very nearly a failure, there being not enough raised to supply the home trade. The early varieties of potatoes are good in quality, but short in quantity; late varieties gave a heavy yield, but rotted badly.

We have a variety of soils—clay, clay loam, sandy, and black mucky soil. The prevailing timbers are beech and maple, with considerable walnut, white-wood, cucumber, oak, chestnut, and other varieties. The walnut has nearly all been sold, at good prices.

Tile drainage is on the increase each year.

All the products of the farm are very low, making rather close times for money matters; but we think that we will get through all right.

All kinds of live stock are very low, but we might say the live stock interests of our county are in a prosperous condition, and the best specimens of horses, cattle, sheep, and hogs are constantly being introduced from abroad to improve our flocks and herds.

Our manufacturing interests are limited, although we have one of the best factories for the manufacture of bee materials in the State. We also have one of the best hollow-ware foundries, and the only surprise is, that they have lived and prospered so long, for they have had to compete, not only with convict labor of this State, but the combined competition of this and other States.

We are, each year, improving our grounds. This year we have built more box stalls for horses, and added to our buildings a very fine dining hall. We hope to go on, each year, making our place of meeting more attractive and convenient.

The interests of the society are increasing year by year. Our grounds, which contain about twenty two and one-half acres, are not roomy enough, and more land will be purchased as soon as arrangements can be made.

We had, at one time, several Granges, and now, I think, there is not more than one which is in good working order. There should be more interest taken in the Grange meetings, as I think there is no organization so beneficial to the farming community, when rightfully and judiciously conducted.

I know of no farmers' clubs in the county, but in nearly every neighborhood we have a literary society; and in these farmers' topics are discussed, taking the place of farmers' clubs.

We have a Farmers' Institute, annually, under the management of the Agricultural society, which is largely attended, and full of life and interest. We held one on the 4th and 5th of January, Secretary W. I. Chamberlain, Prof. Orton, and Gen. Hurst being present. W. Miller and Prof. Weber were advertised to be present, but did not appear. The following resolutions were unanimously adopted:

Resolved, That the farmers of Medina county, assembled as a Farmers' Institute, approve the action of our State Board of Agriculture in purchasing and improving the new State Fair Grounds, and of holding the same as the property of the State, for the advancement of the farming interest.

Resolved, That we respectfully request our Senator and Representative in the Legislature to sustain with liberal appropriations the action of our State Board of Agriculture in improving the new Fair Grounds.

Resolved, That the Secretary of this Institute place a copy of these resolutions in the hands of our Senator and Representative, and have the same published in the newspapers of Medina county.

Resolved, That, as a mark of appreciation to the gentlemen who have entertained and instructed us at the Institute with their admirable addresses, and, also, to the State Board of Agriculture for supplying us with speakers to render our Institute so successful, we extend a vote of thanks; and that the Secretary be requested to forward a copy of this resolution to the State Board of Agriculture.

MERCER COUNTY.

This county is located in the Maumee Geological Division, is level, and has a dark clay soil, resting on a blue clay sub soil.

Timber.—Burr, sweet white oak, ash, hickory, beach, elm, walnut, etc. Fruits.—Apples, pears, and grapes. Grain.—Corn and oats. Vegetables.—Potatoes, cabbage, turnips, etc. Kinds of stock.—Horses, mules, cattle, sheep, and hogs.

The style of farming has greatly improved in the past twenty years. More corn and grass and less wheat and oats are grown. More good stock of all kinds is found. The building are, generally, good and substantial. Tile draining is now looked upon as a necessity to successful farming; much has already been done, and much more contemplated. The manufacture of tile is now about equal to the demand.

The condition of society is as good as can be expected in a community where schools, churches, granges, farmers' clubs, and institutes, and an annual county fair are in full vogue.

The general success of agriculture, the past year, consists in having raised a fair wheat crop and good oats and hay crops, for which the farmers are receiving about enough to pay them for producing it.

Our Fair Ground is now in excellent condition, with new buildings of all kinds, all substantial. It is located adjoining the corporation and reservoir. The reservoir now forms a beautiful lake, abounding in different kinds of fish. It has an area of twenty-seven and one-half square miles, or about seventeen thousand six hundred acres, making it the largest artificial body of water in the world. Since the completion of the L. E. & W., T., C. & St. L., C. V., W. & Michigan Railroads through Celina, the reservoir has attracted large parties of hunters and fishermen from all parts of the country. Fish of different varieties abound, and during the spring and autumn of each year, wild fowls gather here in large quantities. It thus offers a rich fishing and hunting resort, and is becoming better known year by year. Mr. P. A. Ellis, proprietor of the Ellis House, owns the beautiful little steamer *Ida May*, which he keeps for excursion, fishing, and hunting parties. He also has a flat, furnished with stoves, beds, and complete furniture, which he conveys to any of the islands and leaves it until the parties wish to return. Excursions, consisting of Sabbath schools, lodges, etc., visit here during the summer season, simply as a place of recreation, as it offers inducements to boating, hunting, and fishing parties. Our Fair Ground, adjoining the reservoir, is a beautiful place, with grove, splendid water, and shade that is used by excursions.

During the winter, or ice season, it furnishes as fine a field of ice for packing purposes as can be found anywhere, and we believe that, at no distant day, ice houses of stupendous proportions will be found here, and kept stored with ice of as fine a quality as can be asked for in any market.

In the summer, it gives promise of becoming a watering resort of no inconsiderable importance. At all events, it can be utilized and made to contribute large to the residents of the county, as well as to the pleasure of the whole community.

MIAMI COUNTY.

We have nothing unusual to report in the agricultural interests of the past year.

Our crops, excepting wheat, have been good, and while finances have been rather stringent among our farmers, they as a rule are energetic, aggressive,

and awake to the many questions involving agricultural interests, and the spirit of improvement is very manifest.

The improvement in the live stock of the county in the past few years in remarkable, this being especially so of draft horses.

The County Fair of 1885 exceeded anything ever held in the county. The exhibition in all departments was full, and in horse and produce departments were almost phenomenal for our county. Our granges have aided very materially in bringing about this result. The past three years have increased the number of entries at our fairs from between seven and eight hundred to over two thousand, and at no time in the history of our county has there been so deep an interest in the success of our Agricultural Society. This we believe to be largely due to the election of our board by popular vote in the different townships of the county.

We have been free from diseases of domestic animals, except slight prevalence of swine fever in some localities.

MONROE COUNTY.

The Thirty-fourth Annual Fair of the Monroe County Agricultural Society was held at Woodsfield, on the 1st, 2d, 3d and 4th days of September, 1885. The weather was fine and the attendance up to the usual standard, except the last day which was very cloudy, and the grounds very wet from a hard rain the evening before, which caused a very slim attendance on that day, consequently our receipts were barely sufficient to pay expenses and premiums.

There was a very fair display of stock in all departments, with a growing tendency for better grades. The display of poultry was the largest ever exhibited here; quite a number of men have engaged in the business and are raising all the fine breeds of chickens. This industry is very much on the increase.

The season was not the best altogether for some crops, especially wheat and hay. Wheat was very scattering on the ground, and the yield much below the average. Hay was also light, many old meadows yielded scarcely enough grass to pay for cutting; however, we are consoled by the fact that what was gathered was of good quality.

The principal crops raised here are wheat, rye, oats, corn, tobacco, sorghum, and hay. The manufacture of Swiss cheese is also carried on quite extensively. Some fruit is also raised here, especially apples; peaches to some extent and plums, but both were complete failures this year. The black knot is killing all the plum trees and many of the sour cherry trees. A considerable quantity of stock is raised in this county, which from its hilly nature is well adapted for that purpose.

Since our railroad, the Bellaire, Zanesville and Cincinnati has been complete, now several years, we have easy means of transportation, and large quantities of butter, eggs and poultry are shipped to Wheeling, Pittsburg and other eastern cities.

Interest in the fair is still on the increase, and I think much good is being done. We now have the grounds in good shape, and are well prepared for holding fairs without much outlay.

MORGAN COUNTY.

The Thirty-third Annual Fair of the Morgan County Agricultural Society was held on their grounds, at McConnelsville, Ohio, September 16th, 17th,

and 18th, 1885. The attendance and exhibition were much the largest ever held on the grounds, which we attributed to three causes: The first being fair weather; the second, the prohibition of all gambling devices; the third, the new departure of making it strictly a county fair (with the exception of sweepstakes in all classes).

The farmers have, within the past few years, greatly improved their stock. Thoroughbred horses, cattle, sheep, and swine are being introduced all over the county; more particularly is this the case with sheep. This county is well adapted to this branch of stock. The surface is hilly and the soil is limestone.

Our principal crops are wheat, corn, oats, potatoes, tobacco, and hay, and the various varieties of fruits and garden vegetables grown in this latitude. But stock-raising, however, is, and must continue to be, the chief industry of this county, on account of the formation of the land. We dare say that there is no better grazing territory in the State than that found in this county.

Our wheat crop for 1885 was not up to the average, owing to the heavy frosts.

The corn crop was as large as any, if not the largest, ever raised in the county.

The oat crop was very large, and of good quality; also tobacco yielded more than an average crop.

Potatoes were about on an average with former years.

The hay crop was short, but good in quality.

We raised just about enough fruits for home consumption.

The farmers of this county are improving their style of farming, using more commercial fertilizers, and taking more care of that made on the farm; also more generally using the best labor-saving farm implements. Our buildings are fair. Those that have been built within the last year or two, would be a credit to any county in the State.

Tile is not used much, as the lay of our land is such that it does not require draining.

The condition of our society, socially, intellectually, and morally is very good. We have our county well supplied with schools. We have churches of almost all denominations.

Granges, Farmers' Clubs, Wool Growers' Associations, and Farmers' Institutes are in operation.

Generally speaking, agriculture in this county was moderately successful in the year 1885. The principal work of our Agricultural Society will be found in the statistical report of the Secretary and Treasurer, which is herewith submitted.

MORROW COUNTY.

The Thirty-fifth Annual Fair of this county was held on the Society's grounds, at Mt. Gilead, on the 6th, 7th, 8th, and 9th days of October, 1885. The weather was all that could be desired, and we had one of the most successful fairs ever held in this county. Our stalls and stock pens were all filled with the best stock in the county; and in fact we had to remove quite a number of horses into the city for want of room on the fair grounds.

Live stock generally has thrived well, and the standard (notably in cattle and horses) is each year being advanced. The demand for blooded cattle is supplemented by an increasing demand for better classes of horses, and the honors are about equally divided between the roadster and the heavy draft horse for the farm.

Breeding of thoroughbred sheep in our county is attracting our farmers' attention to a great improvement in our Merinos and long wool sheep.

Swine in this county are being vastly improved, Poland Chinas, Berkshires, and Chester Whites being the leading classes.

The breeding of poultry has increased more than any other one thing during the last two years.

Wheat, oats, corn, and potatoes are the principal crops with which our farmers are successful.

Corn would have given a very large yield, but was much injured by grasshoppers, which destroyed some fields almost entirely, and were also very destructive to the oat crop.

A great deal of tiling has been done in the county during the past ten years, and much more should be done. The farmers are each year learning more and more the value of draining. The good results derived from draining have given rise to several factories within our county, one large factory being run by steam power. The supply is not equal to the demand. The drainage of high clay lands by means of tiles has proved productive of the best results.

There are several valuable stone quarries, apparently inexhaustible, to supply both local and foreign demand.

The people of this county are a progressive people, and are taking a great interest in the improvement of their farms and stock.

We claim to have as moral and intelligent a class of people as any county in the State.

Our churches and school privileges will compare well with those of any other county.

Our crops of 1885 were good of all the different kinds. We have a large surplus of wheat, corn, and oats.

Our Society having adopted the rules of the Board governing county societies, will hereafter elect their President and Vice President from the Board.

MUSKINGUM COUNTY.

This county, lying as it does at the intersection of the old National Road and the Muskingum, has always enjoyed a good deal of the traffic of the southeastern part of the State. Our facilities for the shipment of goods and produce are also very good connected by the Ohio canal with Cleveland, and by the Muskingum river with the Ohio, and the various cities throughout the west and south, together with direct water communication with Pittsburg. The B. & O. R. R. running through the center of the county gives direct connection to the sea shore, as well as to Chicago, and the other lake and western cities. The P., C. & St. L. runs through the northern part of the county and the C. & M. V. traverses it from north to south. By means of the Connotton Valley road we can reach all the great trunk lines of the country. The B., Z. & C. Narrow-gauge runs through a rich mining and agricultural country and contributes largely to our prosperity.

The Black Diamond route, now under construction, will open up a new country to us which is rich in fruits, farm products and coal. The Columbus and Eastern crossing the southwestern part of the county reaches a fine grazing region, where also are inexhaustible quantities of coal, limestone, flagstone, and potters' clay. A new railroad projected to Marion, Ohio, will pass through a fertile valley, where there are plentiful supplies of iron ore and coal.

The surface of our county is as varied as are its productions. The valleys, and there are many, are rich, sandy alluvium washed from limestone hills, and seem inexhaustible. Planted in corn, year after year, they produce abundant

crops without fertilizers. The hill soil is generally limestone, and we venture to say that there are not better hill farms in the world than some in this county.

Our products run through all the list that be raised in this climate, while our gardeners are known from Pittsburg to Chicago and St. Louis, from Cleveland to Cincinnati and New Orleans.

The principal complaint the last season was that the crops were too abundant, and hence the prices too low.

Our apples are unsurpassed, and the exhibition at our fair last fall of nearly fifteen hundred plates and baskets was a surprise to all who had not given the subject attention.

We have on our hills the finest grades of sheep and hogs. The first Merino sheep brought to the State was brought here, and our breeders find a profitable business in that line. Our cattle interest is large and growing, and some of the finest herds of Devons, Jerseys and Holsteins graze on the rich grasses of our farms. Our horses too are in demand, and the exhibition in this department at our fair has annually increased until, during the last three or four years, we have not had stable room enough, although we have over a half mile of stalls.

The wheat this fall has looked very fine, and unless the late cold spell injures it we will have an abundant crop.

Our rains are generally seasonable and sufficient, and it is a very rare thing for a crop to fail to mature.

Al together we do not think there is a better county in Ohio, taking into consideration the variety of its crops, and the quantity and quality of its mineral productions. Information as to anything regarding our county may be had by addressing the secretary of our Society or any of our lawyers or real estate men.

NOBLE COUNTY.

The thirty third Annual Fair of the Noble County Agricultural Society was held at Sarahsville, Ohio, September 16, 17, and 18, and was an unqualified success, both as to the quantity and quality of the exhibits and the appreciative attendance and patronage of the people. This society, by its liberality and watchful care of the interests of the people, has succeeded in making for itself a very creditable reputation. The display was on an average with former years, and the fair proved a success financially. This will enable us to reduce to some extent the debt incurred last year in repairing our track and making other necessary improvements.

Improvements in live stock are still going on, and our farmers are wide awake on that subject.

The wheat did not stand the winter as well as in former years. The quality, however, was good, but the quantity was not large. The average was lower than last year, although there were a few fields that made a good yield.

The corn gave an average yield, although considerably damaged by a heavy wind-storm in September.

In most localities, fruits of all kinds were almost a failure, except grapes and apples.

The oat crop was fair, but the acreage was small, and, as a consequence, the crop will not more than supply the home consumption.

Our hay crop, this year, was fully equal in quality to that of last year, and was, perhaps, as good in quantity.

Buckwheat is not much cultivated. There is none for export, and not enough for home consumption.

The tobacco crop was about sixty per cent., and of good quality.

The yield of potatoes will not exceed seventy-five per cent. of an average crop.

Of turnips we had a good crop; the quality is good also.

The growing wheat looks well, and promises a good crop for next year.

Notwithstanding the discouraging aspect at the close of the year 1885, our farmers are hopeful, knowing full well that the capital they have invested in the rich and productive lands of Noble county is safely invested, and that a partial failure of crops for one year may cause inconvenience and lessen the dividends, but that it will have no serious effect upon the capital stock invested.

OTTAWA COUNTY.

The Annual Fair of Ottawa county was held on the grounds of the society at Port Clinton, Ohio, September 17, 18, and 19. In point of attendance, it was the most successful meeting in the annals of the society. It was, also, financially a success. The weather was pleasant, and some very good trotting, mostly by local horses, was had.

The general exhibits were about up to the average, both in number and quality.

The cereal crops, last year, were below the average. The peach crop was a total failure. Grapes had about half an average yield. The failure of the peach crop was due entirely to the very severe winter of 1884-85; and the partial loss of the grape crop was also due to the same cause, the less hardy varieties suffering much more than those that are acclimated to this region.

Agricultural matters show a fair degree of prosperity in Ottawa county.

PAULDING COUNTY.

The Agricultural Society of Paulding County held its Annual Fair for the year 1885, September 29 and 30, and October 1 and 2. The Ruler of all things blessed this Society with the finest of weather during the whole of the four days, and notwithstanding the scarcity of money, the attendance on the third and fourth days was better than for some years past. The entries in the domestic and agricultural halls were not above the average in numbers, but in quality they have not been excelled in the history of our county. The entries in the stock department out number those of any previous fair, and the quality of stock exhibited as far excels that of former years, as does the number of entries.

Some as fine thoroughbred stallions were on exhibition, and are owned in the county, as any of the older counties can boast of. The speed ring was one of the entertaining features on the third and fourth days. The lovers of the turf enjoyed the fine pacing, running and trotting, the latter being made in 2:29½, the best time ever made on our track. The display of farm and carriage horses was also very good.

The visitors attending our fair were much surprised to see the quality of cattle on exhibition in so new a county. This year was the first for the Holsteins to make their appearance on our grounds. It was an agreeable surprise to us

to be called on for stalls for a herd of twelve of them. That stately animal, the much favored Shorthorn, as usual, was on exhibition, claiming a fair share of the awards, besides several others of the beef breeds. We also had on exhibition a herd of Galloways, which was just brought in from Northwestern Canada, by one of the enterprising farmers of the Maumee river. They had not recovered from the fatigue of the long journey on the cars at that time, and looked somewhat careworn, but now are improving finely, and bid fair to be the leading cattle of the day. They are the first of that blood introduced in this county. The little Jerseys do not seem to be so popular with our farmers as do the heavier breeds.

The exhibition in the swine and sheep department, while not so great in numbers, certainly is hard to excel in quality. Display in poultry was only medium, both in quality and number of entries.

This being a new county, the entries in farm and mechanical implements are somewhat limited, but the display this year was larger than those of former years.

The ladies were not behind with their fancy and ornamental work, and this seemed to be the center of attraction in the floral hall.

Our county is located in the section of country heretofore known as the "great black swamp region." The word "swamp," however, does not apply to it. The general surface is comparatively level, there being no hills or abrupt elevations; but the whole county gently inclines to the northeast, giving us a drainage of about four to six feet to the mile. The Maumee river enters our county on the west, six miles from the north line, and wends its way eastward through as fertile a portion of country as Ohio can boast of; the Auglaize enters near the southeast corner, and courses northward through a country similar to that of the Maumee. The intervening portion is drained by numerous creeks and smaller streams, all coursing northeasterly, our streams being numerous enough to afford drainage for every section of land in the county. As for quality of soil, this section of country is unsurpassed, being well adapted for the raising of all kinds of grains and vegetables grown in this latitude.

Wheat the past year yielded from 18 to 25 bushels per acre. The crop receiving the award at the fair was $39\frac{1}{2}$ bushels per acre.

The early frost injured corn much more than was anticipated, yet a great deal of our corn yielded over 60 bushels to the acre.

Our forests are extremely heavy, being composed of oak, hickory, black and white ash, cottonwood, elm and most other varieties of the soft wood timbers.

Two main trunk railroads cross our county east and west, and one north and south, opening up facilities for the manufacture of timber at various points, making the timber worth more money now than the land was worth four years ago. The manufacturing of all kinds of timber is carried on to a great extent now. When the lands have been cleared, farming will be the principal occupation. This has proven an excellent county for all kinds of grass. Clover grows to great perfection, yielding from seven to ten bushels of seed per acre. The day is near at hand when the possession of a farm in Paulding county will be a mine of wealth to the possessor.

PORTAGE COUNTY.

The Annual Fair of Portage county for 1885 was pronounced by all to be the best and largest ever held in the county. The people expressed by their exhibits and attendance, their confidence in the management, which no doubt

was well merited. The managers, one and all, did what they thought was the best that could be done, and put forth every energy to make the fair a success. They may well feel proud of the result.

The exhibits in all the departments were good, with, perhaps, the exception of swine. The races were excellent and gave good satisfaction.

The description of this county was given in the report for 1884, and it would be useless to re-write it for the present year. Last year we suffered from the hardest drouth ever known here, while in the summer of 1885 we had abundance of rain, and a large quantity to spare. Weeds took possession of some undrained wet fields and made farming on such land unprofitable.

Dairy farming as well as other kinds, in short, all of farming were less profitable than they should be in order to make the farmer a happy man. The farmer who conducts his farming on business principles and with necessary forethought, has as usual been the most successful.

The people of Portage county are a progressive, thoughtful and intellectual class, and take advantage of every facility to make their farming good and their home surroundings pleasant and cheerful.

Tile drainage is on the increase, and receives hearty indorsement wherever tried.

The apple crop was not as good as we generally have. Some orchards were very productive of fine fruit, and thousands of barrels were shipped out of the county at remunerative prices.

Portage county is quite thickly inhabited, and the farms are of moderate size, and we think we have the greatest inducements to offer to parties wishing to invest capital, either in manufacturing or in farm lands.

PREBLE COUNTY.

The Preble County Agricultural Society held its Thirty-fourth Annual Fair on its grounds at New Eaton, on Monday, Tuesday, Wednesday, Thursday and Friday, September 28, 29 and 30, October 1 and 2, 1885. Our fair this year was considered by all who visited it, the best ever held in the county, both in exhibition and attendance.

As the report of the Secretary will show, we had never had such an exhibition of fine horses of every class exhibited by men of our own county, such as Mr. Abram McNutt, of Lewisburg, and Swisher & Co., and others.

In the cattle show we had a fine exhibition of all grade, Shorthorns, Holsteins, Jerseys, Devons, Herefords and Poiled cattle.

In swine there was made, as usual, a good show of Poland China, Berkshire, and Jersey Red.

Our sheep pens were not so well filled as in some other years, but the animals exhibited were fine.

The show of poultry was the largest and best ever had.

The display of fruit and vegetables, both green and preserved, was very good, indeed.

The specimens of grain of all kinds were large and of fine quality.

Our fine art hall was, as usual, well filled with the handy work of the ladies of our county, who never neglect their part of the work at our fair.

The display of farm implements was large and well arranged. The display of carriages and buggies was larger and finer than any previous exhibit in this department.

I may truly say that the agricultural condition of our county is fast improving, and our public improvements are good.

We have held farmers' institutes in our county with good results, and will hold one this year at Eaton, Ohio.

Our Society has this year expended about nine hundred dollars in buildings and other improvements, is out of debt, and has a small bank balance in its favor. This much for good management and economy. This year's fair was the most successful one ever held in our county, and as a mark of appreciation, the members of the Society have re-elected the old Board by a large majority. The Board here return their thanks and promise to make the next fair a good one, and to make all who attend it enjoy themselves.

PUTNAM COUNTY.

The Thirtieth Annual Fair of the Putnam County Agricultural Society was held on its grounds at Ottawa, on the 7th, 8th, 9th and 10th of October, 1885. While the annual fairs of this Society have been improving from year to year, for several years, the last was by far the best ever held.

The exhibition was the largest in all departments, except possibly in fruits, and in each was superior of its kind. The attendance was at least one thousand and fifteen hundred larger than ever before.

Our county is a county where miscellaneous farming is carried on.

Potatoes and onions are raised to a profit, and are of excellent quality.

Wheat, corn, and oats are raised extensively.

The stock and quality of cattle has been greatly improved, both the milk and beef breeds, as well as that of swine and sheep. Also the horses of the county have been greatly improved by breeding in all of the different classes.

The dairy interest is also in a prosperous condition; and there is a decided improvement in the manner of farming, in consequence of which farmers are receiving better results from their farms.

RICHLAND COUNTY.

The Eleventh Annual Fair of the Richland Agricultural Society was held September 29 and 30, and October 1 and 2, A. D. 1885, and was in point of exhibit and attendance, the largest ever held in Richland county. As was remarked on every hand, the exhibit in every department would have done credit to any State Fair. On Thursday the weather was everything that could be desired, and the attendance the largest ever seen on the grounds in one day. Although almost every dollar offered in premiums was taken, the Society was enabled to pay everything in full, and have a snug sum left. We can certainly rival any county in the State for a moral and orderly exhibition, all intoxicating liquors, wheels of fortune, and gambling devices of every kind being excluded from the ground.

Our county is particularly adapted to mixed farming, the surface being broken, and in the south somewhat hilly, furnishing a great amount of natural drainage, and also furnishing a never failing supply of pure spring water.

Our staples are wheat, corn, oats, hay and potatoes, and certainly for quality of any of the above products, we cannot be beaten in any county in the State.

We have also a number of breeders of almost all kinds of fine stock, and

persons needing anything in the line of fine sheep, horses, cattle, swine, or poultry can be supplied from old Richland county.

Our shipping facilities are first class, three of the main trunk lines of the country pass through our county seat. Tile draining has come to be matter of course, and but very few farms in the county that do not have more or less tile drains.

With regard to farmers' institutes, we have a regularly organized institute in our county, which holds its meetings every three months, and the yearly meeting is looked forward to with great interest, for then we expect Chamberlain, Terry, Gould, or some other of the best instructed in the State to be with us.

With regard to the condition of the county, religiously, socially, intellectually and morally, almost every denomination of the Christian Church is established, and apparently well sustained, and the intellectual, moral and social condition, will rank with with the best.

: ROSS COUNTY.

The board of directors of our Society were fearful that in consequence of hard times, together with the failure of the wheat crop in this section of the State, the people would not have the means or inclination to attend the fair. They were agreeably disappointed. The receipts were nearly four hundred dollars more than ever before; the attendance on Thursday was the largest ever known in the history of the Society, and the exhibits were not only the most numerous, but the best. The receipts for entries were four hundred dollars in excess of any previous year, and the payments on account of premiums was \$800 00 in excess of any other year. This will show that the people are taking more interest in the fair than heretofore.

Our county is one of the richest and most productive sections of the country, and has an energetic, intelligent people, and the Society believe an interest is being awakened among them which will make the fairs of the future even greater than those of the past.

We had a new departure in our fair exhibits—special premiums offered by outside parties. For instance, Mr. L. G. Delano offered various premiums for the get of Referee, foals of 1885. These premiums amounted in all to \$50; the entries were five colts and ten fillies. This exhibit added much to the interest of the horse department. Messrs. Secrest & Gilmore offered special premiums for best bread made from the Spring Valley flour; there were thirty one entries. Our exhibits in the horse and cattle ring were excellent, especially in the cattle department, which was much superior to former years. Our Society has this year three hundred and eighty members.

The last report of this Society contained a full report of the kind and character of our soil, and also gave a general account of the lay or topography of our county, to which reference is here made.

Our principal crops are corn, wheat and hay. The corn crop this year is considerably larger than usual, will probably be about 3,000,000 bushels. This is owing largely to a favorable season, and to the further fact, that the wheat crop was almost a total failure by reason of the severe winter, a very large acreage of it being plowed up and put in corn in the spring. The average yield of corn per acre is about 40 bushels. The yield of wheat per acre was very small.

The agricultural interests of our county are in a good condition. Our farmers are in good circumstances, and their farms in a good state of cultivation.

Our growing crops were not troubled with destructive insects this year.

Our farmers are keeping up the farmers' institute, and are taking quite an

SCIOTO COUNTY.

Scioto county, being one of the river counties of the State, is not progressing as rapidly in agricultural pursuits as some of the inland and northern counties. But some progress is noticed, and it is hoped that more interest will be given to County Fairs, Farmers' Institutes, and other sources of improvement in the future.

Our County Agricultural Society (as newly organized) has entered upon the fifth year of its duties, and though, from sufficient causes, we have held no County Fairs, yet it is expected that the time has now arrived to do so.

The corn crop for 1885 was of splendid proportions and excellent quality, leaving a large surplus for outside markets.

Hay and other crops suffered from the drouth.

Scioto county is well provided with free turnpikes, and has sufficient railroad facilities for marketing her surplus crops.

Churches and schools also are in sufficient numbers to meet the wants of the population, and at no distant day this county will take a forward movement among her neighbors in the advance of agriculture and horticulture.

SANDUSKY COUNTY.

The year 1885 was the beginning of a new era of prosperity for the Sandusky County Agricultural Society, this being due largely to the influence of the Farmers' Institutes and to the increased interest taken by the farmers in new and improved methods of farming. They are beginning to understand that the farmer's work is not merely a dry routine of manual labor, but that the most successful farmer is he who does the most mental work in connection with the manual labor incident to farm work.

The exhibition of 1885 was one of unusual interest. The various halls were filled to their utmost capacity, and the character of the exhibits was never finer. The attendance was very large—so large that the management have felt the necessity of more room, and have already purchased an adjoining strip of land containing seven and one half acres, at a cost of forty-five hundred dollars.

The permanent improvements, during 1885, consist of an elegant and commodious music hall and new fences. The society is sadly in need of more room for the display of farm and mechanical products, and it will, during the coming year, build a new hall for that purpose.

The society is now out of debt, and if there is anything like a reasonable activity on the part of the management next year, a right snug little sum should be netted from the proceeds of our next exhibition.

SENECA COUNTY.

Seneca county lies in the north-central part of Ohio, immediately west of the Connecticut Reserve and immediately north of the forty-first degree north latitude. This degree of latitude, being taken as the base of operation in surveys, is commonly known as the base line. In shape, Seneca county is a rectangular parallelogram. It contains fifteen townships, three north of the base line and five west of the Fire Lands or Western Reserve. Tiffin is the

county seat (with a population of over ten thousand), and is located about the center of the county, on the Sandusky river. It is a manufacturing as well as a commercial city. There are a number of factories here that turn out all kinds of machinery, agricultural implements, stoves, cabinet ware, etc., affording employment for a great many laboring people. Tiffin is also the seat of Heidelberg College, one of the best educational institutions in the State. The attendance at the college shows that there are many young men, not only of Ohio, but of every State in the Union, that avail themselves of the advantages that Heidelberg affords. There is a theological seminary in connection with the college that each year sends out many young men into the ministry.

Great improvements have been made in the city during the past year. A number of fine dwellings have been built; a new Court House building and a new college building have been erected; these being as fine structures of the kind as are found in the State.

The surface of Seneca county presents some diversity. The western part is level or rises in long undulations, and in the north western part features lacustral are presented. This portion is very fertile, and the soil partakes of the nature of black muck. The central and eastern part is rolling, and the soil, a gravelly clay. The soil throughout the county is productive, and when properly cultivated will yield for the husbandman abundant crops in the various cereals that grow in this latitude.

The crops during the past year were, on the whole, abundant and of a good quality. We may here drop the remark, that when agricultural results are good anywhere in Ohio, they are so in Seneca county.

In the line of live stock, continued increased interest is noticeable on every hand. Better grades of horses, cattle, sheep, and swine are being kept. Of horses, we have general use, draught, and roadsters; of swine, we have chiefly Poland China, Chester Whites, and Berkshires; of sheep, the Merinos, Longwools, and a few Southdowns; of cattle, chiefly Shorthorns, many Jerseys, and a few Holsteins. The latter are just being introduced here. It may be said that Seneca county stands high, both in agricultural pursuits as well as in live stock.

The product of her quarries should not be overlooked. There is lime stone of the best quality, and in abundance; also clay for brick and tile. The natural gas craze, if such it may be termed, exists in Seneca county as well as in other counties. Wells have been started in Tiffin and Fostoria. The well at Tiffin already yields gas, and the prospects for a useful well are good.

Special mention should be made of the culture that is found among our farmers. This is not only maintained but enhanced by the Grange and farmers' clubs. These organizations are kept up in the various townships, not for the purpose of making or saving a little money, but for the benefit derived by the discussion of topics pertaining to the farming interests, and for the social culture it affords. School houses dot the county in regular sections. Winter and summer sessions of school are held by competent teachers. With the college at Tiffin and an academy at Fostoria, as well as one at Green Spring, educational facilities are as good as can be found in any section of the country. The Farmers' Institutes that are held at Tiffin have no small influence in this direction. These are well attended, and are looked forward to each returning year with renewed interest. Institutes have become a fixed fact in Seneca county.

The Seneca County Agricultural Society held its thirty third Annual Fair at Tiffin, Ohio, the last two days of September and the first two of October, 1885. The fair was a success in every particular. The entries do not number so many on account of premiums being taken away entirely from ma-

chinery, saddlers' and shoemakers' stock and, in general, on all manufactured articles and store displays. The halls and all exhibition rooms were filled, however, and the display was up to that of any previous year in all departments. On Thursday, October 1st, the attendance at the fair was unusually good, the crowd of people being larger than was ever known to be on the grounds. The society made one departure from its usual course last fair, and it gave universal satisfaction to the farmers. It limited privileges on the grounds to but a few—a candy stand, swing, picture gallery, and two striking machines. Intoxicating liquors are not allowed on our grounds under any circumstances. The financial result of the fair was good, making enough to pay all indebtedness save a special tax that, by right, the county commissioner should pay.

SHELBY COUNTY.

The history of Shelby county, in respect to its agricultural advantages, has been so well and truthfully written in the reports of 1882, 1883, and 1884, that a further allusion to them here would be but a repetition of what has already been said.

Although our people are steadily improving in all that pertains to the welfare of an agricultural community, yet there is room for further advancement, and the Farmers' Institute that has been established for the first time in our county this winter, we hope will be the means of more rapid advancement in the future.

Our county certainly offers advantages over many counties in the State in its fine, graveled roads, making it easy for the farmer to get his produce, and the manufacturer his goods and wares to the market at any season of the year. Our churches, schools, social and literary clubs will compare favorably with those of any other county in the State, and while these facts exist, our moral barometer is gradually rising.

There has been great advancement, the past few years, in underdrainage. Many tile manufactories have been erected in the county, and tiled ditches are being laid as rapidly as possible.

Our fairs have been steadily increasing in interest for several years past, and this year's exhibition was no exception to this gradual improvement.

For some time past it has been very evident that our fair grounds were too small, and the accommodations for exhibitors far short of their actual necessities. To try to improve these defects as much as possible has been the work of our association the past year. Forty new horse-stables were erected, besides many new pens for sheep and hogs, and coops for poultry. Many other improvements were made, and it was expected the accommodations for exhibitors would be ample; but before the opening day arrived the horse-stables, sheep and hog pens were all taken. Cattle-stalls were then substituted for horse-stables, and workmen were employed in erecting additional pens and coops until the evening of the second day of the fair.

Our twenty-sixth Annual Fair was held on the 22d, 23d, 24th and 25th of September. The weather was fine during the whole time, and the attendance large. The aggregate number of entries exceeded that of any preceding year, and the display in many departments was the best ever made in the history of the society.

For want of room in the different halls, many persons were unable to exhibit or make any display. Especially was this so in the carriage and house furnishing departments.

The display of agricultural implements was fine. The number of entries in that department was so great as to necessitate the changing of this exhibit to a much larger space than it has occupied heretofore. Shafting and power were furnished to all exhibitors requiring it. The great interest taken in this department was evidenced by the continued throng of spectators as the different tests were made.

Floral and art hall was packed with the handiwork of the ladies and artists in needlework, hairwork, waxwork, embroidery, plaques, hammered-work, painting, and drawing, all appearing to vie with Nature's plants, flowers, and bouquets in endless variety and color and every conceivable arrangement, many of which deserve especial mention.

A very interesting feature of this department was the display of a cabinet of curiosities, loaned by our fellow-townsmen, Mr. W. J. Wilson, of the United States Squadron, and collected by him from the different countries visited in his cruise around the world.

The display in domestic manufactures was fully up to any heretofore made by the society.

The horticultural exhibit was below the average of former years, yet creditable in several classes. Especially fine was the display of pears and grapes, including many of the newer varieties, which attracted especial attention.

The display of apples was quite limited, owing to the destruction of our orchards during the severe winter of 1879. The prospect for an abundance of this fruit in the near future is good. The old orchards are being replaced by hardier trees, which many of the new varieties prove to be.

Small fruits are being planted more extensively than in the past, as they give quick return and extend over a long period. The display in this department by the ladies, of canned fruits, jellies, preserves, pickles, etc., was in endless variety, and the arrangement complete, proving most conclusively that our fairs cannot help being successful where the ladies are so much interested in preparing and displaying such great varieties of their handiwork in articles that add so much to the comforts and luxuries of life.

The display of vegetables and grain was remarkably fine, and has never been excelled in any of our former exhibits, the hall being entirely too small to accommodate any of the classes properly.

The crops of grain in our county this year were fully twenty-five per cent. in excess of that of 1884.

The show of horses was the largest we have ever had, and evinces a steady improvement, both in light harness and draft breeds. Our track was never in better condition, nor the trials of speed more satisfactory than this year. Our farmers, of late years, have turned their attention more to the breeding of heavy draft horses.

The display of sheep, for several years past, has been very much below that of former years, and the quality of wool raised is principally heavy merino. This year was an exception to the general rule. The entries were larger than ever, and the quality of animals exhibited showed very plainly the improvement being made, both in wool and mutton sheep.

A full report of the hog department would be but a repetition of what has been said in reference to sheep—the best we ever had. Our farmers seem to be waking up to the subject of stock improvement.

We were visited during our fair by several members of the Logan County Agricultural Board, and during the following week a number of our Board returned the visit to the Logan County Fair. We think great benefit would be derived from more frequent intercourse with the different agricultural boards,

thus securing an interchange of thought in the management of county fairs, and profiting by the best results. We will endeavor to establish this custom with the boards of our neighboring county so far as this Board is concerned.

STARK COUNTY.

A year ago we gave a general description of the surface, soils, products and so forth of the county, and therefore will confine our report more closely to the condition of the crops harvested during the past year, which were far from being as satisfactory as could have been desired by the hard workers of the soil.

Wheat.—This is the crop in Stark county upon which the farmers rely for the money with which to meet their obligations to make the necessary improvements, and when a crop comes as near being a failure as that for 1885, you may be sure there is much "lamentation and weeping."

We cannot remember a fall with a better growth of wheat or prospects for a grand crop than the fall of 1884, and which stood the severe winter better until the March following, when the bitter cold wind killed all that was exposed. The snowfall in the northern half of the State extended into the northern part of our county, and where the wheat was sheltered by the snow, or by timber or hills, the yield was good, some fields yielding as much as 46 bushels per acre, but where the wheat was not thus protected—the southern part—the farmers did not get the seed back, many farmers having no wheat to harvest, neither any to sell; consequently, the acreage of corn, barley and oats was increased.

The oat crop was good, yielding from 40 to 60 bushels per acre, and some yields as high as 86 bushels have been reported. In yield of oats, Stark and Wayne sometimes exchange places in leading the counties of the State.

Barley is not considered a paying crop any more, and very little of it is grown.

Rye.—About enough rye is grown by each farmer to furnish straw with which to bind up his corn fodder, and the grain is generally chopped and fed to the horses.

Corn was a satisfactory crop last year. The corn was well matured when cut off. The grain is not alone the object of raising this cereal, but the fodder as an auxiliary to keep a large quantity of stock on the farm enters largely into the consideration of the thoughtful husbandman, and is well taken care of, tied up in bundles of a size convenient to handle, hauled into the barn, and by many farmers cut fine, and by others run through the cylinder of a threshing machine, which tears it into shreds, when it is eaten up cleanly by horses, sheep and cattle, and helps the feed to hold out wonderfully.

Hay yielded a magnificent crop and was well cured. Many of the wheat fields which were sown to grass yielded from one to two tons of hay per acre, which, at \$10 per ton, the price all summer, proves as remunerative as an average crop of wheat, but many farmers will suffer any inconvenience *rather than sell hay off the farm*. This, I think, is as it should be, as it prevents the impoverishing of the soil.

Potatoes are not grown very extensively in the county but still of sufficient quantity to supply the home markets. The yield was rather below the average and considerable rot was reported, but many sprinkled air slaked lime among them when stirring them in the cellar, thereby causing the rot to dry up.

FRUITS.

Apples were only a half crop, but at that, they were sold down as low as 15 and 10 cents per bushel, and winter varieties from 25 to 50 cents per bushel for hand picked. Much cider was made but sold very low.

Pears were a full crop, and those who knew their business realized \$2.00 per bushel for Bartletts, F. Beauties, Seckles and other choice varieties; but many who are too indifferent to join our Horticultural Society will peddle choice varieties of pears through the streets for less than half what they could get, were they willing to inform themselves in their calling. It is remarkable what severe cold pear trees can endure, and come out white with bloom in the spring. They are hardier than apples, but when the bloom has once opened, they cannot endure the frosts that apples will.

Of peaches we had none. Cherries and plums were also scarce.

Small fruits we had in abundance, and at very low figures.

Our county ranks second to none in the State in production of fruit, in quantity and quality. And had you seen the display of fruit at our county fair, you would have come to the conclusion that the Stark County Horticultural Society has accomplished some good during the seven years of its existence. Its membership contains the cream of our farmers and horticulturists. One hundred and eighteen members (heads of families) represent a total membership of over 500 persons, whose influence for good is a power in the land, and manifests itself annually at our fairs in the large lists of fruit on exhibition, being correctly named, and if any is mislabeled, with what alacrity the error is discovered and correction made.

In meeting from place to place in the different parts of the county, many varieties of fruit are brought up, some of which prove acquisitions and others not. The exchange of thought often proves beneficial, and the monthly meetings are all well attended, and during the summer months are held under the two large tents owned by the Society.

The Stark County Fair of 1885 will long be remembered by the people of the county as one of the best county fairs probably ever held in this or any other State. This being largely brought about by the harmonious action of the Board in getting out of the old ruts and taking an advanced position, viz.: first—having five days fair instead of four, thereby having one more chance on the weather, should it prove foul; second—opening up all pedigreed stock classes to the world; third—having the second day free to all children under eighteen years; fourth—enlarging their grounds; fifth—erecting a large art hall.

The interest in the fair manifested by the business men, manufacturers, merchants and others, by the offering of many valuable special premiums in the different departments, was fully appreciated, and went far towards bringing out the fine display composed of the 4,382 entries, while the Akron Fair had less than one-third as many.

The display of horses was truly magnificent. In '83 we had 161 entries; in '84, 261 entries, and in '85, 323 entries in the horse department.

Each day we have a grand parade of all the live stock that can be led around the half-mile track, but we could get the cattle on the track only after the horses were taken off, as they alone made a complete circle of almost solid horse flesh, and was the wonder and admiration of all attending the fair. Less than a dozen horses were from out of the county, and competition was very close in many of the classes.

The Bell Bros., of Wooster, importers of English Shire and Cleveland Bay horses, had five of the former and one of the latter breed on exhibition, being successful with all in the show ring, and carrying away \$45.00.

They have a regular prize winner in "Young Napoleon," a very fine large strawberry roan horse that won 19 prizes in the show ring in England, and not less than half a dozen in this country, among which was first premium at the State Fair in Columbus in 1884, in a class of 17 English Shire stallions, four years and over, and, of course, he won the sweepstakes for draft at our fair. But while "Young Napoleon" is hard to beat, and tips the beam at 2,200 pounds, and is held by his owners at something like \$5,000, he had a grand rival in "Speculation," owned by Niesz and Houtz, of Canton. With his grand, majestic appearance, towering form, fine jet black glossy coat, white hind feet and ratch, he was successful in courting the favor of all spectators, and winning first—\$15—in class English Shires, and again in sweepstakes, draft stallion with five of his get, sucking colts, \$20. "Speculation" proved just as successful a year ago, when he won first in his class, and sweepstakes for draft.

But there were so many good horses that we dare not particularize further, lest our report prove tedious. Our farmers are awakening to the fact that it pays well to breed to only the best, as it costs less in the end.

Quite an interest is taken in the county in favor of better cattle, and many good, well-bred bulls may now be found of the different breeds. Most notably are the Shorthorns, with the Holsteins a close second; a good number of the latter being introduced the last year. We predict that Holsteins will be the favorites in a few years to come, although the entries show 30 Holsteins and 43 Shorthorns, with Alfred Brookes absent, who owns the largest herd of Shorthorns in the county.

Only a few are interested in the Jerseys. Their small size militates against them, and farmers are slow to accept that a "big thing" can be in anything so diminutive.

The special premium offered by Joseph Dick, manufacturers of hand and power fodder cutters, Canton, Ohio, a \$45 hand and power fodder cutter to the exhibitor of the cow yielding the greatest quantity of milk and butter within 30 days, was awarded a registered Shorthorn cow, Fountain Maid 18,538, owned by L. A. Bloomfield, of Middle Branch. The yield of milk was 1,338 pounds, and butter, 61 1-16 pounds, accompanied by a sworn statement.

Two herds of Holsteins and one of Shorthorns from without the county were shown.

Sheep in fine wools were a grand lot. Squire Pontius, James McDowell, H. C. Rudy, and R. E. Wilson, residents of the county, each had a full class of entries. John D. George & Son, John Pow, and ——— Van Fossen, non-residents, had each a full class of entries. Competition was very close, as all had very fine specimens. Mr. William Duvall, of Lexington Township, had a very extra flock of Oxforddowns on exhibition and carried away some \$70.

Several very good flocks of grades or general purpose sheep, adapted to our soil and climate, were also on exhibition, and excelled the Cotswolds, which are falling into disrepute, owing to their snotty nosed condition.

Swine also made a good showing, notably the Poland Chinas, which were well represented by herds from the breeding pens of Snyder & Creighton and J. F. & J. A. Forney, who carried off nearly all the honors.

Berkshires were shown by ——— Camp, of Richville, and H. S. Hudson, of Rootstown, Ohio, and it is but just to say that the show of hogs was never equalled at our fair, either in quality or quantity. The same may be truthfully said of all the live stock classes.

The display in the machinery department was simply immense, and the wonder and admiration of all beholders, and many were the expressions

likening it unto the "State Fair." We think there were fully two acres packed with engines, threshers, self-binders, (four different makes, two being newly invented, one by a machinist of Canton, the other by the Kettering Bros., two young farmers, who are also mechanics; they invented and made the patterns and machine on their farm which is one of the best in the county), reapers, mowers, plows, drills, fodder cutters, etc. Most of the machinery was manufactured in the county.

A very interesting feature of this display consisted in the large and tasty notices put up over some of the machines finished in the highest style of the art, like the following:

"This self-binder will be presented to the township in the county making the best display of live stock and farm products, by C. Aultman & Co."

"This mower will be presented to the farmer taking the greatest number of first premiums in live stock and farm products, by the Peerless Reaper Co., Canton, Ohio."

"This \$45 hand and power feed cutter goes to the exhibitor of cow yielding the largest quantity of milk and butter in thirty days, by Joseph Dick, Canton, Ohio."

"This \$25 hand feed cutter will be awarded to the best Holstein cow owned in the county, by Batty & Harrison, Canton, Ohio."

"This plow will be awarded to the exhibitor of best collection grain and field seeds, by Bucher, Gibbs & Co., plow manufacturers, Canton, Ohio."

"This plow will be given to the farmer raising the best field of wheat, not less than four acres, by Ball, Gibbs & Co."

But time fails me to enumerate all the valuable prizes given, which were the means of so materially aiding in the fine display in all the departments.

So far we have only referred to the classes wherein the men were the exhibitors, and lest there be an erroneous opinion formed, we will try and convey a faint idea of the magnificent displays made by the ladies.

Old floral hall, 200 feet in length, containing numerous transepts, recesses, and alcoves, thus affording double the space and surmounted with three domes, the central of which rises 70 feet from the floor, and in which a gallery was placed some years ago in which shelving was placed for fruit and domestic articles, and which was ample for all demands made upon it for space until the last fair proved altogether inadequate. Notwithstanding, a fine art hall, 44x74x16 in the square, had been erected, yet the Horticultural Society's two tents, each 24x50 feet, and another 30x54 feet, were called into requisition before the craving for space was allayed.

The premiums offered by the Board were largely increased the last year, which was highly appreciated by the ladies, together with the fine special premiums offered by several of our merchants, was the lever that brought up the fine displays.

The class of paintings was very fine, and far exceeded anything of the kind before attempted.

But the *needle work* was what the ladies mostly prided themselves in and with just pride at that. The genial sewing machine agents, France & Hershey, of Canton, offered a \$55 White sewing machine for the best *silk quilt*. This brought out a large number of fine quilts, and the machine was won, by general consent, by Mrs. Jennie Hoover, of Marlboro. Mrs. Keplinger, of Canton, had the finest display of needlework, ably seconded by Mrs. Wilson, of Massillon.

The floral display was very fine and attractive.

The class of domestic articles was more than double that of any previous year. The special premium \$25 Boss cook stove, donated by the generous tinware firm of Wernet & Muhs, of Canton, for the best gallon of

apple butter, and which was won by Mrs. Franklin Ruff, in a contest of 39 exhibitors. The \$30 silk dress pattern, given by Zollars & Co., to the best fruit cake, induced a display of 43 entries, and was awarded to Miss Francie A. Fast.

The \$35 set of jewelry offered by Chance & Rose, and the \$10 toilet comb case, by Mrs. M. Kapper, went a long way in bringing out 64 entries in butter, each entry five pounds, or 320 pounds of butter, which, with the Society's premium, was won by Mrs. Thos. Van Horn; and the \$60 seal plush sacque, offered by the enterprising dry goods firm of Goldberg Bros., to the lady who takes the greatest number of first premiums in this class, awarded to Mrs. J. K. McDowell, competition being so close that although having the most, yet the number was only five. These prizes, with many smaller ones, were the cause of the grand display in this class.

The display of fruit was a very fine one, consisting of 900 entries and 1,213 plates, which proved a very tedious and arduous task for the committee.

The vegetable class was double that of any previous year, there being upwards of 170 specimens of potatoes on exhibition, and it was utterly impossible to do justice to all, and consequently some mistakes were made.

Taking it all in all, I doubt if the Stark County Fair of 1885 will ever again see its equal. Not alone were the displays grand in the extreme, but the weather was just the right kind, and the attendance was much greater than ever before.

The "children's day" was a good advertising medium, and the kindness shown by the management of the Valley Railway, in placing two cars from the North and two from the South, at the disposal of all under 12 years of age, was, it is needless to say, fully appreciated.

The growth of the fair during the several years past has truly been remarkable. It has been far greater than people generally realize, though they have been attending it year after year. But the amount of interest prior to the last year has not been commendable. The people have been slow to recognize the benefits that are secured from these annual exhibitions of the best products of the county. But the change this year was a gratifying one. The people all over the county have been striving, apparently, to see who could contribute the most towards its success, and the result was placed before us in all its greatness and splendor. Such exhibitions of farm products, domestic animals, mechanical inventions, art in all its branches, skill in household work, mercantile business, and every conceivable display which goes to indicate the industry, skill and intelligence of our people were never before gathered together.

The Directors labored very hard to get the interest and good will of all our people, and the result is they received their just reward of praise.

SUMMIT COUNTY.

The Summit County Agricultural Society held its fair on October 6th, 7th, 8th, and 9th, at Akron, Ohio, on its beautiful grounds, called Fountain Park, one of the finest grounds in the State. Beautiful natural springs supply numerous fountains, which are located at places suitable to accommodate all stock departments and halls with pure spring water. The railroad facilities are all that could be desired by exhibitors and visitors. Our grounds are well shaded, and our half-mile track is one of the best in Ohio. Our halls are large and commodious enough to accommodate all who wish to exhibit.

The horse department had a very large display of as fine a stock of horses as the country will afford.

The cattle department was well filled with the best breeds of our land, and much competition resulted.

The sheep department had a large number of exhibits of the various breeds, which were creditable displays.

The swine department was well filled—Berkshires, Poland-Chinas, and Chester-Whites being the leading breeds.

A grand show was made in the poultry department, and much interest was shown here by visitors.

The display in agricultural implements far exceeded that of former years.

The agricultural hall was filled to overflowing with the products of our county.

Domestic hall was very nicely and tastefully arranged by the ladies.

Floral hall was a thing of beauty, and was much admired.

Merchants' hall could have held nothing more, and every thing was placed to the best advantage.

In art gallery many very fine drawings were exhibited.

Buckeye machinery hall was very attractive, and many people watched the working of their self binders and reapers.

The Empire hall also was well filled, and the display of self-binders and mowers was a credit to the fair.

Our attractions during the fair were the best ever had on our grounds. The horse trotting was the greatest of these, the most speedy horses of the Northern States participating.

The crops of our county for 1885 were, on the whole, very good.

Wheat was of good quality, but the yield was only half a crop. Corn gave one of the largest yields we have ever had in the county, but a large per cent. was soft owing to the cold, wet weather which prevailed while the grain was ripening. The size and quality of the oat crop were never better. Barley is grown, but not at all extensively. The timothy crop was splendid, and well secured. Clover gave a short crop, owing to winter-killing. The crop of early potatoes was splendid; the late potatoes, however, rotted to some extent.

Apples yielded only a half crop, but were of good quality. The cherry and peach crops were total failures. The pears were of good quality, and such a large crop that they were a drug on the market. Raspberries and strawberries yielded medium crops in quantity, but of good quality. The yield of grapes was sufficient for the market, and the quality very fair.

Much attention is paid by the farmers of Summit county to feeding stock and fattening cattle and sheep for market.

Besides manure, they use various fertilizers, bone dust, phosphate, and some lime being used to advantage.

Our farmers are, as a rule, of an enterprising character, building on their farms good, commodious buildings and neat fences; cleaning up waste grounds and underdraining swamps, making good fertile fields of them. Taking all in all, they make good husbandmen, worthy of imitation.

TRUMBULL COUNTY.

The fortieth Annual Fair of the Trumbull County Agricultural Society was held in Warren, September 10th, 11th, and 12th, 1885. The weather the last two days was nice, but a severe rain of several days duration closed the evening of the first day, so we had fairly good weather finally. Attendance was better than the average, on account of several special matters, among which

was an agricultural address by Governor George Hoadly, on the 11th, which drew many Democrats to the fair, who do not attend under ordinary circumstances; and on the last day many Republicans swelled the crowd to a larger number than on Governor Hoadly's day, thinking they saw something political in it, but which was not the case, as it was distinctly agreed and understood there was not to be anything political, and it was to be solely agricultural. Had it not been for the very bad weather we would have had the greatest crowd ever seen on the ground. Our receipts for the last three years more than paid expenses and premiums, and our fair is enjoying prosperity, except for a debt of about \$3,000, which has been on the Society for several years; but we are steadily reducing it by good management.

Our county is as finely laid out as any in the State, and has many fine farms and houses. Its educational, religious, and social advantages are the very best one could ask for.

The land of Trumbull county is greatly undulating, well drained and watered by many streams of fine water and springs, producing pasture in abundance, which furnishes plenty of food for cattle, sheep, horses, etc., which are raised in large numbers, and form the leading industry of this county, although corn, wheat, oats, potatoes, and hay are extensively raised, together with many fruits, berries, etc., apples being the chief fruit.

Agriculture is extensively followed, and farmers' clubs, granges, societies, etc., are in vogue among our people.

The manufacture of butter and cheese is also one of the greatest industries here, while the oleomargarine and butterine are at present being loudly condemned.

Crops were generally quite good this year, except potatoes, which were not a general success.

The county was never so completely furnished and deluged with apples as this year; the very finest and choicest varieties were delivered in market at twenty-five cents per bushel.

On the whole, it was a good year for crops and agricultural products in this county.

TUSCARAWAS COUNTY.

The fair of 1885 was more than usually successful; not so much from a financial standpoint, as from the general exhibition made, and the general good feeling manifested. Visitors, as a whole, went home expressing the opinion that the fair was a grand success. The sale of intoxicating liquors of all kinds, as well as gambling of all descriptions, was strictly prohibited, and this largely added to the success of the fair. Receipts were not quite up to last year, on account of bad weather on every day except Friday, on which day the weather was delightful, and the attendance very large.

Entries in all the departments were larger than ever before. Especially was this true in the floral hall, which was a scene of brilliancy never before attained here.

The exhibit of ladies' fancy work was most remarkable, and fully equaled that generally shown at state fairs. Also worthy of special notice was the display of fine furniture, exhibited by Messrs. Bisman and Kintz, a new but quite extensive manufacturing establishment at Canal Dover.

The exhibit in horses, sheep, poultry, and implements, were equal to those of any former fair; while in cattle, swine, and products of the farm, it excelled any fair ever held in the county. Some ten or twelve additional pens had to be built on the second and third day of the fair to accommodate the

large number of swine; also quite a large number of box stalls had been built previous to the fair. Even then all could not be accommodated. Quite a number of good animals were stabled in Canal Dover for want of room on the grounds.

There is a steady and healthy improvement in everything that pertains to agriculture in our county, and especially in the improvement of live stock. We have some very fine herds of Durham cattle, Poland-China and Berkshire swine. Jersey cattle are also in demand.

The wheat crop was almost a total failure in the county—not enough for bread and seed—and what little there was being mostly of an inferior quality. Oats promised a splendid crop; grasshoppers, however, cut that short about twenty per cent. The hay crop would have been light, but owing to the failure of wheat many wheat fields that had been sown in timothy were cut for hay, thus increasing the hay crop to above the average. Corn was above an average crop, and mostly of good quality.

Potatoes were an average crop, some few rotting on clay soils. Cloverseed was even a worse failure than wheat; there was scarcely any in the county. Rye and buckwheat are but little grown.

Dairying is becoming a leading and lucrative industry in the western part of the county; the eastern portion is mainly producing sheep and wool, and in the central and northern portions of the county while wheat and corn are the staple products, good horses and cattle are raised there.

But one entry in field crops was made.

Our fair this year would have been a success financially, as well as otherwise, had the weather not been so inclement on the first two days, but notwithstanding the adverse weather we made expenses, paying premiums in full, and all other incidental expenses, excepting the permanent improvements, the planting of one hundred and thirty soft maple shade trees, and a number of box stalls, which leaves a deficit of about \$340.00 from this fair, to be carried over to next year. The grounds being now in most excellent condition, no permanent improvements will be required for several years. With ordinary weather next year, the society without a doubt, by proper management, will be able to pay the entire indebtedness and leave a neat balance in the treasury.

UNION COUNTY.

The Thirty-ninth Annual Fair of the Union County Agricultural Society was held at Marysville, September 29 and 30, and October 1 and 2. 1885. The attendance was larger than ever before, the gate receipts alone amounting to \$3,447.50. Our grounds are well located, about one half mile from town, between two turnpikes, and extending from one to the other. The inclosure contains about fifty-three acres, a half-mile track, first class buildings, several acres of meadow land, and a large grove.

The natural features and geological structure of the county will forever preclude the development of any other element of natural wealth that will rank with that of agriculture, and hence our county is purely an agricultural one.

The face of the country is generally level, with occasional undulations, serving to break what would otherwise seem a monotonous view. The "Darby Plains" are of unsurpassed beauty and fertility, while the other portions of the county will compare favorably with any other body of lands of like extent in the State. We have all the various kinds of agricultural products in that abundance which proves remunerative to the farmer, while the soil is also adapted to grazing purposes.

In the matter of stock-raising and wool-growing, the people are in advance of many other counties of the State, having been for many years engaged in the importation of the very best grades of horses, cattle and sheep from Europe. Shorthorn and Jersey cattle, Spanish Merino sheep, and fine draft horses from this county have taken premiums at different fairs throughout the State. Our favorite hogs are the Poland-China, Chester-White, and Berkshire, many thousands of which are shipped from the county every year.

The corn crop for 1885 was very large, inasmuch as the number of acres planted was greatly increased, while the frost was late enough to allow it all to thoroughly ripen. The wheat, oats and hay crops were fully up to the average here for the last five or six years, but there were not enough potatoes for home consumption.

The fruit crop this year in Union county was virtually a failure, except that of pears, which was undoubtedly the largest ever known in the county.

There are about thirty tile manufactories in the county, which during certain portions of the year are unable to supply the demand. The surface drainage all passes into the Scioto valley, by streams which flow by gentle current in a southeasterly direction.

Lumbering is carried on quite extensively in the northern part of the county, the timber being of the usual deciduous varieties, the more important of which are hickory, oak, ash, and sugar.

The people are industrious and enterprising, and are so fully alive to the advantages to be gained from a general education of the masses, that our agricultural society has an educational department at the fair, in which prizes and premiums are offered for excellence in that line. Then the Farmers' Institute, of which the citizens generally are very proud, is so well attended that the large court-room, where the sessions are held, is always crowded to overflowing during the lectures.

VAN WERT COUNTY.

The twenty-ninth Annual Fair of the Van Wert Agricultural Society was held on the grounds of the Society September 9th, 10th, 11th, and 12th. The exhibition was most excellent in all the departments, but owing to rain, the first two days the attendance was not quite so good as last year, and the managers were obliged to continue the fair over Saturday, which added greatly to expenses. The receipts, however, were sufficient to pay all premiums and expenses.

The weather the past year was favorable for all crops. The corn crop was above the average for the past five years, but was a little late maturing, and some farmers commenced cribbing too soon; consequently, there will be some mouldy corn in their cribs.

The wheat crop averaged fully sixteen bushels per acre, and was of excellent quality.

The hay crop, which is getting to be one of the leading crops in this county, was good for about one and one-fourth tons per acre. The surplus, which is increasing each year, is baled and shipped East from the different railroad stations in the county, the price up to this year ranging from \$7.00 to 10.00 per ton, and at that price it is considered the most profitable crop grown in the county. It rarely falls under one and one-fourth tons per acre, and often much above.

Timothy was slightly injured by grasshoppers this year. The crop of clover seed was a total failure, caused by "hoppers." The oat crop was badly dam-

aged by the "hoppers," whose sole mission in the oats field seemed to be to bite off the grains and let them drop to the ground. Rye and barley are but little grown. Buckwheat was injured some by early frost. Potatoes yielded hardly an average crop; the long bugs damaged the vines, and caused a second growth, and early frost prevented the late ones from ripening, and, in consequence, there is much complaint of rot.

There is at least ten per cent. of an increase in the acreage of wheat sowing last fall over that of 1884, and it was mostly put in good shape, got a good start, and looks well.

Fruit was not so abundant as for the past three years. Plenty of summer and fall apples, but very few for winter. Currant and gooseberry bushes have been mostly destroyed by the worms, and little or no attention is paid to their cultivation. The cabbage worm was not so voracious as usual, and most families have cabbage enough for their own use.

STOCK.

Clydesdale and Norman horses are the favorite breeds. Several thoroughbreds of the above are owned in the county, and the improvement in the size and value of the horses is very marked.

The number of thoroughbred cattle of the different breeds is increasing rapidly, as the exhibits at the fair from year to year plainly show.

While the number of sheep has decreased, the quality is improving.

Hogs have been very healthy the past year; but few cases of cholera have occurred.

There seems to be no demand for milk cows. Good dairy butter will not bring more than eight cents per pound at the groceries. The prices of all kinds of farm produce are low; still the farmers are not discouraged, but are ditching and improving their farms. Many fine houses and barns were built the past year.

The question of pikes is beginning to loom up, and while there is much opposition, it is only a question a short time must answer.

WARREN COUNTY.

The thirty-fifth Annual Fair of the Warren County Agricultural Society was held on their grounds, one-half mile north of Lebanon, September 22d, 23d, 24th, and 25th, 1885. Good weather prevailed during the week, and the exhibition held at this time was a most gratifying success. The entries in nearly all the departments were about equal to those of the preceding year.

The show of horses, especially in the general purpose class, has never been surpassed, probably at any former exhibition of the Society.

The exhibit of cattle was creditable, though not extensive, and that of Short-horns was especially fine.

In the swine department, the principal exhibits were those of Poland-Chinas, Berkshires, and Chester-Whites.

The sheep department did not present an exhibit equally extensive with that of last year, yet the show was an attractive one, being composed mainly of Merinos, Oxforddowns, and Shropshires.

The staple products of the soil in Warren county are wheat, barley, corn, oats, hay, and potatoes. Some attention is given to tobacco-raising in the northern and western districts, and this with good success.

The wheat crop of this year was perhaps nearer a failure than at any pre-

vious year in the last twenty. A large acreage was sown in 1884, but much of it was injured by the fly, and a large proportion of the balance was destroyed by the severe winter. The yield was not more than twenty to thirty per cent.

Fall barley was a total failure, on account of the severity of last winter. Scarcely ten per cent. of the acreage sown was harvested.

Oats and hay were both an unusually heavy crop, the former being the heaviest perhaps ever raised in this county. Moreover, the quality of both was excellent, they having been cured without injury from rain.

Spring barley was also a good crop.

Clover is about the only fertilizer used (except manures), and this year its growth was splendid.

Much attention is given each year to tile draining in localities where a sufficient supply has not been already obtained. At least three tile factories are carrying on a thriving business in this county.

Warren county enjoys excellent educational facilities. In addition to superior graded schools in Franklin, Mason, Waynesville, Morrow, and Lebanon, the National Normal University, at the last named place, enjoys a national reputation as an institution of learning. To these may be added a large number of first-class schools in the country districts.

From all the indications, Warren county is gradually assuming a more prominent position each year as a stock raising and agricultural district of the State.

The entire season since May 1st has been favorable to the growth of the crops, and excepting the loss of the wheat and barley, the year has been a prosperous one to the farmers of this locality.

Fully an average acreage of fall grains were sown, and the ground was well prepared beforehand.

Hog cholera, with few exceptions, has not affected our county this year.

Good, *free* turnpikes have been substituted for mud roads in almost every instance, and there is but a single toll-gate in the county,

Our lands are well adapted to farming, being mostly level, or undulating, except a narrow belt on either side of the Little Miami River, extending through the county, and which is, however, profitably utilized for pasturage.

WASHINGTON COUNTY.

The thirty-fourth Annual Fair of the Washington County Agricultural and Mechanical Association was held on the grounds of the association, near the city of Marietta, September 16th, 17th, and 18th, 1885, and was one of the most successful fairs the society has held for many years. The weather was very pleasant, and the grounds were in beautiful condition. The exhibits in all the departments were good, especially those in the horse and cattle departments. In these two they probably never were better, and can not be beaten, or equaled, in Southeastern Ohio. The association is in good condition for the fair of 1886.

CONDITION OF AGRICULTURE.

At the close of the year 1885, considering the general depressed state of business throughout the country, the farmers of Washington county were generally in as prosperous circumstances as those of adjoining and other counties throughout the State. The main drawbacks to the farmers of this county have been the shortage in the wheat and hay crops, and the low price of sheep.

WHEAT.

The wheat crop of 1885 was the smallest that has been produced in this county for many years. The two causes that brought this about were the dry fall of 1884, making it difficult to get the wheat out in proper season, and the open, severe, cold winter, by which the wheat was badly winter killed. This is a good county for the production of wheat, and a failure like the one of 1885 is a rare thing. The yield, in bushels, for seven years, from 1878 to 1884, varied from 281,674 bushels to 533,109, the average for the seven years being 415,849 bushels. The fall of 1885 was quite favorable for seeding, and about 35,000 acres were seeded for the crop of 1886. The wheat, on the first day of January, was looking very well, and with a favorable winter and spring, there will be an average crop in 1886.

CORN.

This county, by reason of the Ohio and Muskingum river valleys, and the valleys of Duck Creek, Little Muskingum, Wolf Creek, Little Hocking, and other streams, is well adapted to corn-raising, and large quantities of it are annually produced. The yield for seven years, from 1878 to 1884, varied from 431,931 bushels to 726,520, and the average yield for the seven years was 630,759 bushels. The crop for 1885 will be about 675,000 bushels.

OATS AND OTHER GRAIN.

In the spring of 1885, considerable wheat ground was plowed up and put in oats and some in corn. The oats crop of 1885 was one of the largest and best crops that has ever been produced in the county. The yield will probably be about 275,000 bushels. Oats is not grown as extensively in this county as either wheat or corn. Rye, barley, and buckwheat are only produced in small quantities.

POTATOES.

The potato crop of 1885 was better than that of the previous year, the season being more favorable. This county is well adapted to potato culture. The average yield per acre for 1885 was about sixty bushels, and the total crop over 90,000 bushels. In the production of sweet-potatoes this county leads all others in the State, and the yield for 1885 will be about 20,000, or about eighteen per cent. of the entire crop of the State. Those produced here are of the finest quality, and are shipped for seed and consumption to various parts of the Union.

FRUITS.

This county leads all others in the State in the number of acres in orchard. Apples, peaches, plums, cherries, pears, and other small fruits, are produced in large quantities, and of the best quality. A great deal of attention has been given to fruit growing in this county for the past fifty years, and many fine orchards can be found in various parts of it. All the leading varieties of fruit that can be produced in this section of the country can be found within its borders.

MEADOWS.

Timothy is the main hay crop in this county, and, with proper care, yields good crops. Clover also.

INSECTS, ETC.

The various crops in this county were quite free from injury from all kinds of insects during the past year, and generally are so. The greatest losses farmers sustain in this county in their crops are either caused by severe cold weather or by drouth.

LIVE STOCK.

All kinds of live stock in this county are generally quite free from all kinds of disease, and were so especially during the year 1885. This county is especially adapted to grazing purposes, and the breeding and raising of stock—especially cattle and sheep—have been carried on very extensively. Some as fine, thoroughbred cattle and sheep as can be found in the State are to be found in this county. The Short Horns, Devons, Holsteins, and Jerseys—both thoroughbreds and grades—are raised here. The number of sheep in the county is now about 100,000.

This county is favorably located to ship stock to the leading markets east. Baltimore, Md., can be easily reached by the B. & O. R. R., and Pittsburgh, Pa., by boats on the Ohio river and by rail, either by the Ohio River Road or by the Cleveland and Marietta Road, via Cambridge. Stock can be loaded on the cars for either railroad, either at Marietta, the county seat, or at Belpre, on the Ohio side, opposite Parkersburg, W. Va., which two places are connected by a railroad bridge.

FARMERS' CLUBS AND ASSOCIATIONS.

This county is well provided with farmers' organizations, that in years past have been the means of doing a great deal of good among the farmers of this county, the effect of which can readily be seen in the county in the general improvement and change in the better cultivation of all kinds of crops, the introduction of improved seeds, the great change that has taken place in the improvement of all kinds of live stock. Among the associations are the Washington County Farmers' Association, under the auspices of which the annual Farmers' Institutes are held each winter; the Muskingum Township Farmers' Club, organized in 1874; the Belpre Farmers' Club; the Washington County Wool Growers' and Live Stock Breeders' Association; Newburg Harvest Home Picnic Association; the Eastern Ohio Wool Growers' and Stock Breeders' Association, and the Ohio Spanish Merino Sheep Breeders' Association. Each have quite a large number of members in this county. There is also a County Society for the Prevention of Cruelty to Animals. All of these associations have been and are doing a great deal of good to the farming interests of this county.

WILLIAMS COUNTY.

Williams county, located in the northwest corner of the State, is generally level, although not so flat as the counties which lie to the south and southeast of it. To the north and west of a ridge running northeast and southwest, on which Bryan and West Unity are located, the land is gently rolling; but there is no spot in the county which rises to the dignity of a hill. We have some stiff, tenacious clay in the county, but the great body of the land varies from a rich, dark clay loam to sandy and gravelly loam.

The county was originally covered with a heavy growth of white, burr, and

red oak, black walnut, butternut, beech, maple, basswood, hickory, elm, and white, black, and blue ash. All the varieties named, together with occasional specimens of several varieties not named, are still growing in our woods.

Pears, and the hardy varieties of apples, are the only kinds of large fruits that succeed here; but nearly all kinds of small fruit do well, and an abundance is raised to supply the home demand.

Wheat, corn, oats, rye, barley, and buckwheat are all grown successfully and profitably, but the first three are grown much more largely than the others. Nearly all vegetables adapted to this climate do well, and are more or less grown, but, as a rule, only for home demand.

Horses, cattle, sheep, and hogs are all raised largely in excess of home requirements, and many of the best breeds in the country are well represented.

Our land is not as well cultivated as it should be, but the prosperity of our farmers, shown by their fine, commodious houses and their large, well-painted out-buildings, proves conclusively that their farm management might have been worse. Each succeeding year new methods and new machinery are introduced, and a variety of experiments made, so that, on the whole, I think this county is keeping pace with the balance of the State.

Tile draining is just beginning to boom. Several years ago a few farmers commenced putting down tile in low places where their crops had generally been destroyed by an excess of water, and from that time until the present there has been a gradually increasing appreciation of its benefits, until now there is hardly a farmer but what understands that, not only his lowest, but also his highest land is materially improved by tiling. During the last season there were eight tile factories running in the county, and I understand they sold all they could make. The indications are that, if the tile can be obtained, many more will be put down the coming season than there were during the past.

Each neighborhood has its school house, with at least six months school each year. Churches are sufficiently near together to accommodate the people, and in some parts too near for all to have good congregations. Granges are not abundant, and farmers' clubs and institutes are less numerous than formerly.

Our fair was well attended, and, so far as I have heard, gave universal satisfaction. The out-look is much better for our next than it was one year ago for our last.

Trusting that your monthly crop reports have given you a better idea of the agricultural condition of the county, during the past year, than I could give you, I close without remarks upon that subject.

WOOD COUNTY.

The thirty-third annual exhibition of the Wood County Agricultural Society, at Tontogany, September 30th to October 3d, was, in every feature, one of the most successful it ever held, and its officers and members are encouraged in believing that an increased interest is being developed among the people of the county which will soon establish it upon a firmer financial basis than it has ever heretofore enjoyed. This gratifying state of affairs is due to the earnest and untiring efforts of a faithful few, who, despite recent great discouragements, have succeeded in offering to the public an exhibition

devoid of nothing in the way of attractions which their exalted enterprise and rather limited resources could furnish.

During the past year the race-track has been enlarged and improved, until it is now unexcelled and rarely equaled in Northwestern Ohio; a new grand stand has also been erected which comfortably accommodates one thousand people.

Considering the unfavorable season for farm products, the display in every department was excellent. The exhibition of fruits was good for the season. The samples of grain and vegetables were worthy of especial mention, and could not have been excelled. The display in the floral and fine art halls were never better. There was as fine an exhibition of stock as was ever made in the county, and the exhibits were so numerous that it was found necessary to build and rent many additional stalls.

The fair was also considered a success financially, the receipts being about three hundred dollars above the amount paid for premiums and general expenses, which sum will be applied toward the liquidation of an old indebtedness.

The election of officers for the ensuing year resulted as follows: President, E. Tuller; Vice-President, Frank Powell.

Crops.—Fruit, almost a total failure; wheat, about eighty per cent. of an average crop; corn, the principal crop in the county, three-fourths of an average; oats, fair; hay, good; clover and timothy seed, very poor (badly injured by the grass-hoppers); potatoes, one-half crop.

ANNUAL REPORT OF VETERINARIAN.

To State Board of Live Stock Commissioners :

SIRS :—I herewith submit my first annual report as Veterinarian of your Board. On May 12th, shortly after my appointment as Veterinarian, I proceeded, according to your instructions, to investigate to what extent "Contagious Pleuro-Pneumonia" existed in the State. I found there had only been two herds affected in the State, viz., that of Mr. C. N. Mitchell, Dayton, Montgomery county, and Mr. C. R. C. Dye, Troy, Miami county. On the 15th, in company with the members of your board, I proceeded to Dayton, and inspected the herd of Mr. Mitchell, which numbered thirty head, and found three partially recovered cases, which were isolated and quarantined for ninety days.

On the 18th and 19th I inspected the herd of Mr. Dye, numbering eighty-three head, and found them free from the disease, and as there had not been an acute case in this herd for over a year, and Dr. Salmon having slaughtered seven head in September, 1884, I did not hesitate in stating that they were free from the plague.

On the 21st I proceeded to the Stillwater Valley and visited the farm where the cattle that Dr. Salmon slaughtered had been pasturing, and after examining the cattle on the farm, I visited the adjoining farms, and made all the inquiries possible, and found no evidences of the disease.

On June 2d, in company with two members of your board, I proceeded to Dayton, and held an autopsy on one of the animals in quarantine, on the farm of Mr. Mitchell, he having concluded to have her slaughtered, as she was a barren heifer, and was in good condition for the butcher. On opening the chest I found the pleura adhered to the walls of the chest and diaphragm nearly throughout its whole extent, and found a small cyst in the left lung the size of an apple, and which was undergoing the process of liquefaction and absorption. Otherwise the lungs were sound.

On August 4th I proceeded to Sandusky to investigate a reported outbreak of glanders. On my arrival, I found that the diseased horses were at Marblehead, a few miles from Sandusky, on the lake shore. The horses were the property of Daniel Kuntz, Esq., who owns and operates a quarry at that place. On the 5th, in company with Dr. McClure, Mr. Kuntz, and an empiric, who was treating the horses, we went over to Marblehead in one of Mr. Kuntz's steam barges. Upon investigation, I found three animals showing well marked symptoms of glanders. I informed the owner of my diagnosis, and advised him to have them slaughtered, as they could never recover entirely, and would keep up the infection. After explaining to him the danger of keeping them, both to his other horses, and to the attendants, he consented to let me slaughter the worst case, which I did in the presence of all; and upon holding an autopsy I found the nasal passages ulcerated nearly throughout their whole extent, and the nasal septum nearly perforated in places. The lungs also showed several tubercles, characteristic of the disease. Mr.

Kuntz seemed satisfied, and said he would kill the other two affected cases. But I have learned since, through Dr. McClure, that he only destroyed one of the cases, and the other still lives, is somewhat improved, and none of the others have shown the disease as yet. But as that is in accordance with the history of the disease, the remaining animal ought to be slaughtered and the premises thoroughly disinfected.

The history of the outbreak is as follows: Mr. Kuntz, sometime the spring previous, purchased an animal in Sandusky with a discharge from the nose, and took it over to the quarry. The animal continued to discharge for sometime after, and he called in Dr. McClure, who pronounced the disease to be glanders, and advised his destruction and the stable disinfected. But instead of doing so, Mr. Kuntz called in an empiric, who said it was not glanders, and could cure the animal. However, soon after some of the other horses began to show symptoms of the same trouble, and the first one getting worse, they thought they would destroy him. Dr. McClure, as soon as he learned of my appointment, notified me of the above, and I went up.

Since I was there Mr. Kuntz called in two other veterinarians, or rather pretenders, and they pronounced the disease to be contagious pleuro pneumonia. It is very evident that they know very little in regard to veterinary science, as pleuro pneumonia contagia is purely a bovine disease.

On the 9th of August I went to Miamisburg to investigate a reported outbreak of disease among cattle, which the owner thought was contagious pleuro pneumonia. But upon my arrival I found one animal, an old cow, in a recumbent position, having been down several days, and unable to rise; and a young heifer that had just died. I held a *post mortem* on the heifer, and found the lungs and liver badly congested, and all the other organs healthy. After obtaining the history of the cases, I came to the conclusion that the trouble was due to prostration by the heat, and nothing whatever contagious about it. As the other animal was beyond the reach of medical skill, I advised her destruction, which the owner said he would do.

On the 10th I proceeded to Clarksville, Clinton county, to investigate a reported outbreak of glanders. Upon investigation, I found two horses on the farm of Mr. Stump, about three miles from Clarksville, and one on the farm of Mr. Spray, with a discharge from the nose, an elevated temperature, and sub-maxillary glands enlarged, but the disease was not sufficiently developed to warrant me in giving a definite opinion. I informed the owners of my suspicions, and advised them to isolate the horses until my return in a few days, which they promised to do. I accordingly on the 8th of September, in company with Mr. Carlisle, President of your board, proceeded to Clarksville, again to examine the above cases. I found the animals showing the disease well marked; all showed the peculiar ulceration of the mucous membrane of the nose, and all the other symptoms of the disease. And I learned that both gentlemen had lost an animal a few months previous, with what I am satisfied was glanders and farcy. Mr. Carlisle ordered the animals in quarantine, and as the owner, Mr. Stump, was about to remove to Wilmington, he asked permission to quarantine the animals there, which Mr. Carlisle granted. Mr. Spray wished also to place his animal with Mr. Stump, which was also granted. The animals were not taken there, I have since learned, but were kept at the farm.

On the 17th of August, in company with Mr. Carlisle, I proceeded to Toledo to investigate a reported outbreak of Texas fever among a herd of dairy cattle. Upon our arrival, Dr. Newton and the President of the Toledo board of health drove us out to the farm. After examining the cattle and obtaining the history of the outbreak, I found them to be suffering from anthrax. Several of the

young animals had died, and as they had been pasturing on low land along a creek where considerable refuse from the city was deposited, Dr. Newton a few days previous advised their removal to high land pasture, which was done, and had the effect of checking the disease at once. And as they have since been kept on the high land pastures, the disease has disappeared. We also examined the stock-yards at Toledo, and found them in fair shape, but upon inquiry as to whether the cars were ever cleaned or disinfected after bringing cattle from the East or West, we were told that they were not, and that cars were only cleaned when they got too full of manure to get the stock in. This is something that needs attention, as it is a very easy manner of spreading contagious diseases all over the country.

On the 24th, in company with two members of your board, I proceeded to Dayton to inspect the herd of Mr. Mitchell again, the quarantine of ninety days imposed upon his herd having just expired. At this time I found that one of the two remaining suspected animals had apparently recovered. The cough had disappeared, she had conceived and had lain on flesh, and the lung had to all appearances recovered. The animal was released from quarantine. The other animal had given birth to a calf, and with the exception of a cough, seemed all right. But to remove all doubts, and with the consent of Mr. Mitchell, we slaughtered her, and upon holding a *post mortem* we found the lung showing scarcely any trouble. But there was considerably frothy mucus in the bronchial tubes, which was no doubt the cause of her cough. Having slaughtered the only remaining case in the State, and as there had not been an acute case in the State for over a year, I advised your board to now declare the State free from pleuro pneumonia.

On October 1st, I received a communication from Dr. Michener, of Lebanon, Warren county, to come down and examine a horse that he thought was suffering from glanders. I accordingly went down, and we drove out to the farm, ten miles distant, but upon our arrival we found that the owner had disposed of the animal in Cincinnati to an Eastern buyer. I read the law to him and left him a copy, and I don't think he will ever do so again.

On the 27th, I received a dispatch from Dr. Hillock, of Lancaster, to come down and see an animal which he thought was suffering from pleuro-pneumonia. I accordingly went down in company with Dr. Hillock, of Columbus. Dr. Hillock, of Lancaster, took us out to the farm of Messrs. R. Work & Son, where I found a Shorthorn bull suffering from acute tuberculosis. As the animal was beyond the possibility of recovery, I advised the owner to have him destroyed and the stall disinfected, which was done the following day. Dr. Hillock held a post mortem, and informed me that he found the lungs and some of the other internal organs completely studded with tubercles of different sizes. Dr. Hillock also called my attention to a Jersey cow belonging to Mayor Drinkle, of Lancaster, which he thought was suffering from tuberculosis. I examined her, and came to the conclusion that she was suffering from tubercular diarrhoea. The other doctors agreed with me, and we advised her destruction, as she was very thin in flesh, and had been receiving considerable treatment which was of no avail. But after our departure, the stableman advised the parties to call in another veterinarian, which was done, and he said we were a trio of fools, and she was not suffering from tuberculosis, and that he could cure her, which he tried to do but she died, and he thought she froze to death. Dr. Hillock held a post mortem, and found her internal organs studded with tubercles.

On November 14th, I received a communication from Dr. Fair, Cleveland, stating that he had condemned two horses suffering from glanders, and wished me to come up and see them. I wrote him to isolate them, or if the owner

would consent, to kill them, and disinfect the premises, and I would notify your board, which I did and received an answer from Mr. Carlisle, with instructions to go up and investigate the matter. But before going, I thought I would telegraph Dr. Fair to know if he had killed the horses, and received a reply that he had, and had thoroughly disinfected the premises. And as he informed me also that he did not think they had infected any other animals, I did not go up.

Owing to several of the western States having quarantined against Ohio on account of pleuro pneumonia having existed here, and requiring persons shipping stock from this State West to have a certificate of health from me, I was called upon to inspect cattle at the following places, viz.: Wellington, Washington C. H., Monroeville, Plain City, Troy, Piqua, Urbana, Woodstock and Plymouth.

On the 16th, I, in company with two members of your board, attended a National convention of veterinarians and state sanitary boards, in Chicago, for the purpose of securing a more uniformity of action of the different States in regard to dealing with contagious diseases, and submitting to Congress our views in regard to amending the present inefficient law in regard to contagious diseases.

It was the voice of the meeting that the Bureau of Animal Industry, with Dr. Salmon as the Chief, deserved great praise for the manner they had co-operated with the different States in suppressing and stamping out contagious pleuro-pneumonia.

Until such laws are enacted by the National Government, and a sufficient appropriation made to enable the Bureau of Animal Industry to slaughter and compensate at a fair value all animals affected with a contagious disease, and especially contagious pleuro-pneumonia, glanders and hog cholera, I think the different State legislatures should make appropriations sufficient to enable the commissioners to investigate and slaughter all animals affected and compensate accordingly.

Hog cholera is one of the most destructive diseases the American farmer has to contend with, and the loss is more from this disease alone than from all others combined. It therefore behooves us to impress upon all public men the necessity of making efficient laws to enable us to suppress the disease, which can only be done by slaughtering the diseased, separating the healthy from them, and using preventive measures.

Glanders among horses is the most dangerous of all the contagious diseases we have to contend with, as it is not confined to the horse but may be communicated to man and other animals. Should the attendant upon a glandered horse have a sore upon his hand or any other part exposed, and get any of the virus into the system, it is sure death to him. This disease, from the above reason, should receive immediate attention. There are several cases of the disease at present in the State.

The horses on the farms of Messrs Stump and Spray, in Clinton county, have been slaughtered and the premises thoroughly disinfected, and all the exposed animals, after being quarantined for thirty days, and upon examination being found free from the disease, were released.

There is at present in the same county a horse owned by Simon Ward, a colored man, affected by the disease, which is in quarantine, he being unwilling to kill the animal.

December 22d, I, in company with Commissioner Jones, inspected the horses of Messrs. Kuntz & Johnson, at Marblehead, and found another animal suffering from the disease in the acute form, which was at once destroyed.

We also saw one or two others that had been in quarantine since my first visit, which we still kept quarantined.

January 12th proceeded to Mt. Vernon upon the request of Dr. Cotton, to inspect a horse owned by Legrand Boynton, and formerly owned by the city. I found, upon examination, a case of chronic glanders, and which was at once quarantined.

January 14th proceeded to Florence, Preble county, to see some horses which were suspected of having glanders. I found upon my arrival a stallion and a mare, both fine animals, showing symptoms of glanders, and which I at once placed in quarantine. I also learned that the attendant, Mr. Wolverton, had died two or three days previous, with what his medical attendant thought was glanders. His diagnosis was undoubtedly correct, as he had a sore upon his hand, and the disease started at that point. He had been treating the two animals above mentioned.

January 21st proceeded to Mt. Vernon in company with two members of your board, and found the horse in quarantine there, in the same condition as when I first saw him. The city, upon the recommendation of your board, took the horse back from Boynton and had him destroyed.

Two other animals that had been exposed were quarantined for thirty days.

I also learned while there that there were two suspicious cases at Gambier, and owned by Clark Stough. But upon investigating the matter, I found that both had been traded off, and that one had been killed, and the other one could not be found.

February 1st proceeded to Lebanon, Warren county, upon the request of Dr. Michener, to see a case of glanders, which, upon examination, I found to be a well developed case, and which the owner, W. L. Edmunds, slaughtered at once, and promised to thoroughly disinfect the premises.

February 22d proceeded to Mt. Vernon to examine horses there in quarantine, and finding them all right released them.

February 25th went to Franklin to see a case of supposed glanders, but upon examination, found it to be a case of nasal gleet.

February 26th went to Florence to hold a post mortem on one of the horses I had previously condemned. Upon examination, I found the lungs in terrible condition, having died from pneumonia or pulmonary glanders.

The other horse was in the same condition as when first examined.

March 9th proceeded to Lima, upon the request of Dr. Lee and the owner of the horse, Walter Gray, Esq., to see a case of glanders. Upon examination, I found a case of acute glanders and farcy. The animal was a loathsome object. The owners had him destroyed at once, and the stall thoroughly disinfected.

March 12th went to Bellevue, upon the request of J. R. Hall, Jr., and the Sheriff of Huron county, to see a case reported to them by Dr. Severcool, of Norwalk, and which, upon examination, proved to be a well developed case of glanders. The animal was owned by Mr. Alexander, and he at once destroyed her, and promised to thoroughly disinfect the stable. Owing to one of his other horses having been driven with the diseased animal, I placed her in quarantine for thirty days.

March 25th proceeded to Circleville, upon the request of the Sheriff of Pickaway county and Dr. G. W. Butler, to investigate an outbreak of glanders among C. E. Sears & Co's horses. Upon examination, I found four well developed cases of glanders and farcy, and one suspicious case. Mr. Sears had the four horses killed at once, and we placed the other one in quarantine. He also had all the stalls torn out and burned, and the stable thoroughly disinfected, and new stalls made.

March 23d went to Kenton, on the request of the Mayor and Dr. Reed, to see two cases of supposed glanders. Upon my arrival, I found one had died, on which I held a post mortem, and found a well developed case of glanders and farcy. The other one was in the country six miles, having been sent there by the owner. This one was a well developed case of glanders and farcy also, and was killed the following day. These animals had previously been in livery stables, but upon examining the other horses they appeared all right. I ordered the barn disinfected, and will examine the horses again in a few days.

March 26th went to Ashley, Delaware county, upon the request of Bell Bros., to see a suspicious case. I found the animal to be suffering with chronic glanders. The owner, Robert Bell, had the animal destroyed at once.

April 8th went to Florence again to see the horse in quarantine, the owner, Mr. Aydelott, having reported that the animal was well, and he wished to sell it. But upon examining the animal, I found it in the same condition as before, and I still ordered him to be kept in quarantine.

April 9th went to Chillicothe to see the animal in quarantine, and still found her in a suspicious condition, and kept her in quarantine.

The symptoms presented in glanders vary somewhat.

Usually, at first, there is a discharge of a watery character from one or both nostrils with some constitutional disturbance, as rigors or chills, elevation of temperature, pulse accelerated, membrane of nose either of a dull leaden color or a pale coppery hue. Later on the discharge becomes more profuse, and of a greenish color. Is tenacious, having a tendency to adhere around the nostril, and may or may not be mixed with blood. If the membrane of the septum of the nose be examined, you may see several nodules or tubercles, which finally suppurate, leaving ulcers, which have a tendency to coalesce. Sometimes the septum becomes perforated or eaten through, unless in the advanced stages of some cases, these tubercles or ulcers are too high up in the nose to be seen.

The gland beneath the jaw, on the affected side, becomes enlarged and indurated, and has a tendency to adhere to the jaw more closely. Where there is not much constitutional disturbance, and the lungs not affected, the animal may live for years, and do moderate work if well cared for. But if worked hard and abused will soon run down, the acute form setting in and killing the animal.

But where the acute form manifests itself, the animal dies in a short time, and very often with both glanders and farcy. When farcy shows itself, small buds or nodules appear on the inside of the limbs or other parts of the body, and finally suppurate, leaving ragged looking ulcers.

Animals that have a chronic discharge from the nose, until they can be examined by a competent veterinarian, should be watered in a separate bucket, and kept in a stall by themselves. They should always be treated as suspicious cases until they can be examined.

The law should be strict in regard to glandered horses, as they are usually owned by traders, who scatter the disease broadcast by taking them from town to town and disposing of them.

The only way to stamp out glanders is to slaughter all animals who show the least symptoms of the disease (as it is very insidious sometimes), and quarantine those exposed for a sufficient time to preclude the possibility of spreading the disease, and thoroughly disinfect the premises, by scrubbing the stalls and boxes with boiling water, and whitewashing with lime and carbolic acid.

The disease is incurable, and as soon as an animal is affected it ought to be slaughtered.

Respectfully submitted,

J. S. BUTLER, V. S.,

Veterinarian of the Board.

LECTURES AND ADDRESSES

DELIVERED AT

FARMERS' INSTITUTES

HELD IN

DIFFERENT COUNTIES OF OHIO DURING THE WINTER OF 1885-6.

UNDER THE JOINT AUSPICES OF THE

OHIO STATE BOARD OF AGRICULTURE, THE OHIO STATE
UNIVERSITY, THE STATE GRANGE, THE STATE
HORTICULTURAL SOCIETY AND THE VARI-
OUS COUNTY SOCIETIES AND LOCAL
ORGANIZATIONS,

TOGETHER WITH

ADDRESSES AND PAPERS PRESENTED AT OTHER AGRICULTURAL
MEETINGS OR OFFERED IN COMPETITION FOR PRIZES.

A REPUBLIC OF FARMERS.

BY GEN. S. H. HURST, OF CHILLICOTHE.

[Delivered at several Institutes.]

Mr. President, Ladies and Gentlemen:

In the life of an American farmer there are no more sacred rights and no more weighty responsibilities than those that belong to him in his relation to the State; and so I come to speak of the farmer, of his character and duty as a citizen and as a patriot. And to begin: this is eminently—aye, it is pre-eminently, a nation of farmers. Whatever else we have in the wealth of our mines and manufactories, of our ships and merchandise, of our mints and banks and massive cities, still it is true that the abounding wealth of this country is in its rich alluvial soil, and that the wonderful cultivated products of that rich soil make us pre-eminently the bread growers of the world. And it follows that mining and manufacturing and merchandising and the skilled mechanical industries are each mere accessories and tributaries to the one great preponderating interest, to the one great field of labor, which, on the sunny slopes, in the fertile valleys, on the wide table lands and almost boundless prairies of this great country, invites a Republic of Farmers to build here a civilization richer and purer and freer and nobler than the world has yet known. We are a nation of farmers. Our homes are built on three and a half million square miles of territory. And the wealth of these homes, and the beauty of these homes, and the light, joy, and charms of these homes, are the true measure of the wealth and happiness and glory of this great people. It is a wonderful history that tells of the conquests of eight generations of American farmers. The wildest dreams of Columbus, or Cabot, or Ponce De Leon, or De Soto never painted a march of empire like that which we have seen. It took our Norman ancestors three hundred years to complete the conquest of their Anglo Saxon neighbors, and to blend the warring races into one common race or blood, and when in after years that race pushed the prows of its rude vessels upon the coast of New England and struggled for a foothold upon her inhospitable rocks, the conquest of this wilderness world of America seemed infinitely more difficult than the former conquest of the British Isle; but the spirit of the new race had in it the strength and courage and pluck of all its elemental blood, and so they determined to stay. But it took them one hundred and fifty years to get a foothold along the Atlantic coast, and to organize their grand army of axemen and plow-men for the conquest of the continent. But at last their lines were formed, and from the Savannas of Georgia to the Green Mountains of the North that grand army of pioneer farmers began to push their victorious assaults against the mighty forests, and civilization certainly and steadily moved westward; and now they scale the eastern slopes of the Alleghenies, and from the summit of the loftiest range look out over the magnificent basin of the Mississippi Valley. What a picture! Nay, what a dream! There, before them, was spread out the most beautiful garden of God's green earth, with two million square miles of the richest alluvial soil on the globe. What a challenge!

Nay, what an invitation to the invading armies of human industry was this magnificent valley as it lay there resting in the wildness of its primeval beauty! What an invitation to the armies of the young republic for the achievement of peaceful victories and for the conquest of wide spreading empire! Nor was the invitation unaccepted. The grand army of pioneer axe men and plowmen prepared to move. The Dutch of New York, supported by the Quakers of Pennsylvania, formed on the right, the Yankees of New England held the centre, while the Cavaliers of Virginia, supported by the Huguenots of the Carolinas, came in on the left. And now that grand army of American civilization pours itself down the western slopes of the Alleghenies like an avalanche into this magnificent Valley of the Mississippi, and moves steadily forward to the conquest of Nature. Never before in history did the world witness the march of an army such as that, and never before did an army win such victories for peace and industry, for freedom and civilization at so small a cost. Forward they go, down the Allegheny, down the Monongahela, down the Ohio, across the great lakes, over the mountains of Virginia and North Carolina into the wilds of Kentucky, Tennessee, and Alabama; still on, and on, and on, across the prairies, across the Mississippi, and up into the great Northwest, where the world's great wheat-fields have been lying fallow for ages. On into Texas and Arkansas; on through Kansas and Nebraska; on through Colorado and Utah; on across the plains and mountains into New Mexico and California, and on up into Oregon and Washington: and thus in two hundred and fifty years, from the time when the keel of the Mayflower kissed the shores of Massachusetts, that grand army of pioneer farmers has swept the continent from ocean to ocean, has conquered from a savage wilderness and planted with free civilization a territory sixty times as large as old England. And more than that, since by their toil and courage and endurance, with the spirit and purpose of freemen, they had laid the foundation for a Grand Republic of Farmers.

Thus does the history of American farm-life seem like a charming romance, as the pioneer farmers of this new country pushed westward their victorious lines until they had captured and subdued and possessed the land. Again, supplementing this ownership of the land by the right of peaceful conquest, the whole system of our land tenure in this country, differs from that of the mother country, and from others of the old world governments. The doctrine or law of primogeniture, and that of the entailment of estates which has obtained in the old aristocracies, are at war with our theories of equal division and distribution. Our own theory and practice in this regard is in harmony with our social and political ideas, which recognize the equal rights of all men before the law, and in practice tends constantly to the division of estates, and to the distribution of wealth among the people, while the manorial or baronial and feudal systems, and the non-resident land-ownership of Ireland, all seek to maintain the lines of caste by keeping the land in large estates, and in the hands of a chosen few, while the millions are but peasantry or serfs, having no proper interest in or attachment to the land. The old doctrine of inheritance and land tenure could not live in the political atmosphere of this country. The fathers who founded the colonies and their sons who founded the States, were wise enough to see that substantially every man who became an owner of land would build a home upon it, and become attached to it, thus planting in the hearts of our people the love of home and the love of the land and country. And, too, this division of estates is a constant invitation to young men just choosing their occupations or professions, is a constant opening and invitation to them to become farmers, and doubtless as a partial fruit of this law and practice of land tenure and inheritance, the great preponderance of the people of this country live on farms, and are devoted to agricultural pursuits. And

when we take into consideration the fact that along with this system of inheritance and land tenure they had adopted the Democratic rule of the will of the majority, we must see that here again our fathers laid the foundation for a Republic of Farmers. But not alone by conquest nor the system or law of our land tenure may we establish our right to be called an agricultural nation. The products of our soil are so vast and so varied that they overshadow all other products combined. If we count the tropical fruits of California and Florida, together with the fruits of all our latitudes, the sugar products of Louisiana and other States, the cotton of Mississippi, Alabama, Texas, Arkansas, Georgia, and the Carolinas, the corn, wheat, oats, rye, buckwheat, barley, potatoes, pork, flax and wool of the central, northern and western States, and all those smaller but important products of the farm, garden, orchard, vineyard, dairy, hennery and apiary, which form so large a part of the sustenance of millions of people in their every-day life, and then add to these direct products of the farm; add to these boundless elements of wealth, the cattle that graze on a thousand hills, and on the prairies and plains all over this land, and it swells the inventory of our agricultural wealth far beyond the value of all other products, in every other department of industry and labor, in all this country combined.

Last year, this grand army of American farmers had under cultivation three hundred million acres of our soil, and when at the end of the year they came to sum up the various crops they had grown on "Uncle Sam's" farm, they found they had produced within that one year 459,000,000 bushels of wheat, 1,755,000,000 bushels of corn, 407,000,000 bushels of oats, 43,000,000 bushels of barley, 19,000,000 bushels of rye, 11,000,000 bushels of buckwheat, (just think of the buckwheat cakes that would make), 900,000,000 pounds of butter, 352,000,000 pounds of sugar,—talk of statistics being dry when you can group buckwheat cakes and butter and sugar in proportions like that,—300,000,000 pounds of cheese, 200,000,000 bushels of potatoes, 9,000,000 bushels of beans,—think of that you boys who were in the army,—472,000,000 pounds of tobacco, 240,000,000 pounds of wool, 2,800,000,000 pounds of cotton. And so on through the whole list. And thus, in one single year, we not only produced enough to feed bountifully the 53,000,000 of our own population, but we sent abroad in that one year \$138,000,000 worth of beef and pork, \$162,000,000 worth of bread stuff, making \$300,000,000 worth of bread and meat exported to feed our hungry neighbors in other lands. And in addition to these we sent abroad during that year \$197,000,000 worth of cotton, and \$370,000,000 worth of other farm products, making a grand total of \$536,000,000 worth of agricultural products shipped abroad during the year, while from all other departments of industry in this country combined, but \$188,000,000 worth of goods were exported; and thus the official reports show that over 74 per cent. of the exports of this country consist of the direct or indirect products of the soil. Surely, as the nations see our ships ploughing the ocean, laden with the wealth of our fields and our barns, bearing their rich cargoes to feed and clothe the people of other lands, surely the verdict of the world must be that the United States is a Republic of Farmers.

But not only are the agricultural interests the dominant material interests of the nation, but our agriculturists as a body, our farmers as a distinct class of citizens, have made such a character for themselves as to warrant the assertion that they constitute the most reliable element in American citizenship to-day, and that as a class they are the hope, nay, they are the *only* hope of the Republic for the future. Republican government is yet an undemonstrated experiment; especially in great cities is it doubtful if honest republican government can be permanently maintained. "The great question of the age," says a

leading statesman, "is how to govern great cities." It is generally conceded that experience has proved the practicability of maintaining real republican government, not only in form but in spirit also, in the rural districts, where the farmers constitute the great body of the citizens and voters, but in the cities the lawless and vicious elements congregate, and plot and plan to control local politics in the interest of vice and crime and lawlessness. As a rule, these elements become so powerful in cities as to hold the balance of power between the political parties which contend for the control of public affairs. Then they become a great army of boodle eaters and corruptionists. Bad men are put in office for the purpose of defeating and defying the laws rather than of enforcing them. And these officers, dependent upon this vicious vote for their election, must reward their supporters by furthering their schemes of public plunder and disregard of law. Socialism and Communism unite to bind together these lawless and turbulent elements, and to create and maintain a constant war between capital and labor. And they are only too successful in accomplishing their unpatriotic and most reprehensible work. Beer stalks in with its low browed and stubby-aired army, and proclaims that Gambrinus is king, and venal politicians and ward bummers whoop it up for the man or the party that pays the biggest price. In this low and conscienceless scramble for office and place, honest work and modest manliness retire to private life in disgust, while brass mounted impudence comes to the front, and marshaling the forces of beer and boodle, take charge of public affairs.

When, where, and by whom shall this political debauch be stopped? Not by the cities surely, where the edict of the caucus, the shouts of the "red shirts," and the stimulus of the saloons all hoot at sober, manly, conscientious, and independent political action. But by the country, by the rural districts, by the grand army of honest bread-winners, who in themselves constitute the majority of the people, and who can control every election if they will, in the interest of honest government, political purity, and public prosperity. In every emergency the nation looks to that grand army of uncorrupted plowmen for deliverance, and in every emergency they are found as true as steel. Our people may indeed bear with these evils long and patiently, too long and too patiently. But when the time arrives the townships will be heard from as well as the wards, and the verdict will go forth "this is not the kingdom of caucus," just as it did once before declare "this is not the kingdom of cotton," and that verdict will again and again declare "this is not an empire of corporations;" "this is not simply the domain of money kings;" "this is not the kingdom of beer;" this is not the mobocracy of Communism;" it is a Republic of Farmers.

Far be it from me to reflect upon the political virtues or patriotic purpose of men engaged in other morally healthful pursuits. For well I know there are multitudes in the towns and cities who feel and think as we do, and who stand ready to bolt the rule of caucus when it is venal, and to vote for the rule of political righteousness. But what I say is this, that they alone are powerless to resist the dictation of the caucus or the mob, while our grand army of farmers are, of themselves, abundantly able to possess the land. It has not been my purpose to speak of farmers in a laudatory manner in comparison with others; let them be judged upon their merits. But I cannot forego speaking of one virtue that pre-eminently marks their characters. I refer to the virtue of modesty. Farmers may sometimes speak of the weather in a social way, and refer to its effect upon the crops, but they are not eternally puffing their occupation into other people's faces with the eloquence of a life insurance agent, or the impudence of a lightning rod peddler. Indeed, their self-abnegation and modesty is simply wonderful. In the matter of politics, for

instance, of which we have just been speaking. While they constitute the great body of the voters of the State and country, and while naturally in harmony with the spirit of our political ideas, they would largely control public affairs. Still as a matter of fact, our farmers have little to do with political management, very little indeed. And while agriculture is the great material interest of the State, outweighing in importance all others, still our farmers have very little to do with the machinery of the government, which is expected to foster and build up all these great industrial interests of this country. Once in a while, it is true, some country squire is sent to the Legislature, but in the Congressional District in which I live, a district wholly devoted to agriculture, but one practical farmer has been sent to Congress in forty years. In the last Congress, out of 325 members, there were only eighteen farmers. Talk about minority representation, when in the representative body that makes our laws and shapes our national policy, the majority interests have eighteen Representatives, and the minority have 307, when the minority have seventeen Representatives where the majority have one. Nor is your State Legislature much better. In the Ohio Senate to-day there are thirty seven members, two of whom are farmers, while thirty-five belong to other occupations, and directly represent the minority interests. If you want legislation to protect your wool industry and your dairy industry, send men to the Legislature and to Congress who are identified with your interests, and will well defend your rights. Lawyers, doctors, bankers, and gentlemen of leisure can go to Congress, and that is all right, but farmers whose interests are the permanent interest of the district, are content to remain at home and occupy the lowest seat in our political synagogue, and modestly defer to others the management of all our great interests. This deference to the ambitious and venal political element is indeed so marked that I dare assert that in the average county of the State a circle of one hundred citizens, made up of ward politicians, saloon-keepers, and political whoopers have more to do in the management of political affairs in selecting the men who are to make and execute our laws and run the machinery of local government than all other classes combined. One hundred such men assume and exercise more political power than five thousand farmers. I do not believe that a parallel to this unselfishness of a like predominant class can be found in all political history. Indeed, I think this deference to the self-seeking and venal political elements not only transcends all comparison, but also transcends all reason, and virtually ignores the political rights that belong to us, and the political duties we owe to the State.

I have tried to tell how, with infinite toil and self-denial, and with a courage that seemed inspired, our pioneer fathers invaded the wilderness of America two hundred and fifty years ago, and how, with the same earnest spirit, eight successive generations of farmers have carried forward the work so courageously begun, until the continent is belted with the mighty net-work of civilized human industries which has attended and followed this wonderful march of empire. How, by the wise and just policy of our laws constantly inviting our young men to build homes and occupy and improve the land, and develop its wonderful resources, agriculture has been made and maintained the great predominant interest of the country. How this work has gone forward until more than half of our vast domain has been taken up in farms, and three hundred million acres in actual cultivation, and until our vast products not only supplied the population of this country, but also furnished \$500,000,000 worth per year to feed and clothe the people of other lands, thus bringing their gold and silver back to us in a balance of trade in our favor of \$150,000,000 per year. How, through all our history, the attachment of our farmers to their land and homes, and to the institutions of our government, has educated them

into an army of patriots, making them the great conservative power of the republic, alike in peace and war. How, as voters, citizens and statesmen, they have helped to plan and build this great and free republic, making it the admiration of the lovers of liberty everywhere, and the home of the oppressed from every land. Founded by the bloody struggle of the war of Independence, and defended by the still more direful struggle of the war of the Rebellion, and cherished and loved by our people for a hundred years, this great Republic of Farmers is our glory and pride. And now, after making all this history, after having built and sustained this republic at so great a cost, shall we, can we, dare we turn it over to the care and management of selfish and ambitious politicians, and their conscienceless followers? *No, No, NO!* We must recognize the fact that farmers as citizens have political duties and civil responsibilities that demand the highest exercise of moral courage. Duties and responsibilities that we may not ignore. In these matters a radical reform is demanded. These evils will not cure themselves; they are growing worse and worse every year. Professional politicians, supported by an army of political leeches and camp followers, are moving like an army with banners to possess the land. Will you surrender this goodly land to their tender mercies? Will you quietly accept them as your law givers, and as the managers and administrators of all your best interests, or will you assert your rights as citizens and as partisans, and command this venal army to retire. Political rights must ever be accompanied with political responsibilities, and a courageous assertion of those rights by the great industrial army of Ohio farmers would correct many abuses that now curse society and degrade the State. I am not a prophet, nor the son of a prophet, but I say to you that the second century of our national life will be, in this land, the crucial test of Republican government. When all our public domain is occupied, when we can no longer spread out, when we begin to build up, when all our young cities shall have grown into magnitude of wealth and population, as well as in vice and communism; when the population of the cities out numbers and overshadows that of the rural districts, when soulless railroad corporations hold every avenue of transportation for your produce, and pocket every year the fruit of your labors, and back of that can buy your legislators and perpetuate their robbery. When money kings come to think that labor is an orange for them to squeeze and suck; when labor organizes like an army and led like a mob, shall hold capital by the throat and demand "divide," when capital alarmed by the torch of the incendiary striker, and the tyranny of labor unions hides itself in tripple barred vaults, and its non investment fills the streets of your city with hungry and maddened men, women and children crying for bread; when the low-browed armies of beer and rum insist that this is a republic of saloon keepers; when beer and communism form a fearful alliance to menace the peace of society and the life of the State, *then* the final struggle for the life of the republic will have come. All these things have come to the cities and the nations of the old world within the century just passed, and they have been met there by the tramp of standing armies, and by the Gatling gun in the hands of imperial power. But in this land we have no standing army, and these very turbulent elements are themselves the imperial power, and the Gatling guns will be in their hands when the fight comes on between anarchy and law. The times are full of peril, and to me there seems no salvation from anarchy, save in the conservative power of this grand army of sterling, patriotic tillers of the soil. Within the next century social changes and political upheavals will come to us of which we scarcely now dream, and at the end of that century, if there be an American Republic worthy of that name, it will be then, as it has been in the past, a Republic of Farmers.

LIGHTS AND SHADES OF FARM LIFE.

BY N. S. TOWNSEND.

[Delivered at several Institutes.]

Mr. Chairman, Ladies and Gentlemen :

I propose to speak of some of the pleasant, and also some of the unpleasant features of farm life. By a fair consideration of the good things which belong to farming, I trust we may learn to appreciate, and profit by them still more; and by honestly looking at such things as appear objectionable, I hope we may find a way for their improvement, or learn to see them in a different light.

In the first place, it may be said of farming that it is an honorable occupation. Many years since, I made an address at the annual fair in Cuyahoga county, and began by saying, "A hungry world looks up to the Great Father and cries, 'Give us this day our daily bread'; this is the expression of a universal want, and a recognition of the source from which the want must be supplied. To answer this prayer is the farmer's mission; he is the medium through which the world is fed; he is the almoner of God's bounty; and, therefore, of all the callings which engage the minds or hands of men, none is more benevolent in its aims, or more beneficial in its results." What was said more than thirty years since, appears to me equally true to-day; certainly no occupation can be more useful than this; for, while it benefits all, it injures none; no calling can be more honest or honorable, for it thrives, not by deception, nor upon the vices and follies of others, but through the blessings of God upon honest labor. The farmer, then, may take satisfaction in the conviction that he has an occupation which is above reproach.

Farming is a healthy occupation; and this is no small matter, for without health there is little enjoyment. The farmer has plenty of varied exercise and plenty of fresh air and sunshine; his appetite is usually good, and his sleep refreshing. His food may be plain, but as it is of his own production, he can be assured that it is free from adulterations; and, with proper attention to the laws of health, the farmer and his family may be healthy and strong. Carefully collected statistics show that the duration of human life is much longer among rural than among city populations.

Farming is a safe occupation, for it is not based upon speculation, nor upon any form of gambling. It is true that a portion of the farmer's crops is sometimes injured by storms, or insects may be sufficiently numerous to do great mischief; but as the prudent farmer does not "put all his eggs in one basket," but diversifies his industries, so it usually happens that if one crop is injured others escape, and in the end his labor seldom fails of an adequate reward. Who ever heard of a farmer becoming bankrupt?

But the pleasantest feature of farming—especially for the young—is its close contact with Nature. In consequence of this, any boy or girl living upon a farm has constant incentives and abundant opportunities to become acquainted with almost all parts of Natural History, which those who grow up in cities do not possess. The value of Natural History is seen in the opportunity it affords for mental training, and in the useful character of such knowledge in almost every situation in life. In addition to this, such studies entirely release farm-life of what some call its dullness, and effectually protect the young from the temptations which come through idleness. Perhaps at the

outset I ought to have addressed my remarks to the "boy upon the farm," for I intend to speak somewhat in detail of the way in which the farmer's boy, starting with objects which come under daily observation, may gradually extend his investigations into wider fields. We may suppose that boys who grow up on a farm are generally sent to school when too young to work; while at school they learn to read, write, and cypher, and perhaps obtain some knowledge of grammar and geography. Physical geography is interesting to most young people; but political geography is sometimes said to be dry and uninteresting. This, however, is not true where intelligent parents or teachers will see that it is accompanied with the reading of books of travel and history. The geography of any country will suggest inquiries in regard to its scenery, climate, and productions. Who are the people? Where did they come from? What have they done? What do I possess, or what have I seen from that country? An outline of any country, when filled up with description and the striking events of its history, is sufficiently interesting and profitable. In this way, in connection with geography, should be read the histories of the United States, of England, of Greece, and of Rome, and perhaps of other countries, during school years. But by the time the boy on the farm is large enough to milk the cows, to drive team, and make himself generally useful, he is likely to be kept busy, and often does not find time or opportunity to go longer to school. Now, the question arises, can the boy as he works still learn? To this the answer is yes, if his work has the usual variety, and especially if his parents are ready to give him aid and encouragement, and will supply him with a few books as they are needed.

To begin, we will suppose that the boy is required to assist in hauling off scattered boulders that are in the way of the plow, or wanted to stone up a well, or to build a cellar wall. These boulders, perhaps, are not all alike, and in some instances a single stone may be made up of different and distinct materials; from time to time attractive pieces are broken off and saved, and the collection thus begun soon contains specimens as yet perhaps unnamed of quartz, feldspar, mica, hornblende, granite, sienite, gneiss, limestone, sandstone, iron, pyrites, etc. His interest in minerals grows with his collection; he makes changes, names are learned, and finally an elementary work on mineralogy becomes a necessity. After such a book is obtained, more rapid progress is made, and the boy learns to classify and name his specimens as they are found.

The soil turned over with the plow, how was it formed? Was it from the crumbling of the rocks which lie underneath, or was it brought into its present position by a stream, or like most of the soil in the northern part of Ohio, is it of the kind usually known as drift? Hillsides, river banks, and in excavations it is often seen that the materials below the surface are in layers, or stratified as if deposited from water, what is now land at one time was the bottom of the sea? These layers, in some places, are almost horizontal; in others they are sloping, and in still other places they are much curved. How were they deposited, and how were they subsequently disturbed? The opposite banks of rivers and sides of valleys often show a striking correspondence. Does this prove that the stream has made its bed, or the whole valley by continuous washing? Back from the south shore of Lake Erie, at some considerable distance from the present water line, and perhaps a hundred feet higher, are continuous sand ridges that appear like the sand-bars which are now forming near the shallow margin of the lake. Was the water of Lake Erie at some time high enough to form these ridges, and if so, what has lowered the lake, and made such changes in the face of the country? When such questions beset a boy, how happy he becomes if favored with the perusal of some good,

elementary work on geology, such as "Geological Excursions," by Winchell, published by S. C. Griggs, of Chicago; and this book is equally well adapted to guide the boy's first steps in mineralogy. From such a work he will learn how the earth's crust was formed; how some portions of the land and the mountain chains were raised, and other portions depressed. What is meant by glacial action, and how such action had covered extensive regions with foreign materials; he will learn to identify the fossils he finds, and obtain some idea of the evolution of vegetable and animal forms. What is learned in this way of stratification, etc., is not only interesting, but it may often be turned to good account in well digging; drainage, etc.

In the spring, when the earth is covered with new vegetation, the boy may ask himself why the warmth of the sun should produce such wonderful effects; why do the trees so rapidly come into leaf and blossom; and why does the grass begin to grow? How do plants obtain the materials for growth, and how do they change that material into such varied forms of beauty, and into substances having such widely different properties? When a boy gets hold of botany, such as Woods' class-book, he is likely to be surprised and delighted to find how much may be learned about plants; not only does he learn how they grow, but also how they are classified and named, and what are their properties and uses. He soon finds that botany has many profitable applications, and he learns to bud, to graft, and to propagate the most desirable fruits, vegetables, and flowers, and useful and ornamental trees. He also sees that the study of botany has a special value as a means of mental training, for its classification is so methodical that the study soon brings those who pursue it with ardor into the habit of arranging all their mental acquisitions with order and system, so that they may be easily retained, and always ready for use.

The boy also becomes interested in the animals of the farm, and as he looks about and sees how numerous and varied the forms of animal life, he is likely to be amazed that so few of such a multitude have been domesticated and brought into the service of mankind. Then perhaps he inquires by whom, and when, and in what countries these were subjects and tamed. He also sees that food must be taken by all animals with some degree of regularity, in order to secure warmth, to maintain the force with which the heart and other parts of the body do their work, and to supply the material for growth, wool, milk, etc. He observes that the movements, activity, and strength of some animals are wonderful, and perhaps he strives to understand by what mechanical arrangement of the skeleton and muscles such movements are possible. Here he will want some good book on physiology to explain the functions which belong to animals, and also a work on zoology, from which to learn how animals are named and classified. In regard to classification, one readily sees the difference between those creatures which have a back bone like fishes, reptiles, and mammals and those which do not; such as radiates, mollusks, and articulates. It is to this last division, or articulate, that insects belong, and these are very likely to attract a boy's attention, in some instances, by their good qualities, for he may have learned to sing—

"How doth the little busy bee
Improve each shining hour,
And gather honey all the day
from every opening flower."

Or he may remember to have read, "go to the ant, thou sluggard, consider her ways and be wise, which provideth her meat in the summer, and gathereth her food in the harvest." He may have been astonished at the amount of mischief which can be done by such little creatures as the cut-worm, the cabbage worm, the currant worm, the codling moth, the Hessian fly, the wheat midge, and the

grasshopper. Then he will want some book like Miss Treat's, on "Insects Injurious to the Farm and Garden," from which to learn more about them; and from "Cleland's Physiology" he may obtain a good knowledge of animal functions.

While interested in plants and animals, the boy will not fail to see how much both are affected by changes of the weather. About the wind he will be inclined to ask, what is it? Where does it come from? And why is it so soft and balmy at one time, and at other times so blustering and chilly? The rain, why have we sometimes too much, and in other seasons too little? What makes the dew, the hoar frost, the hail, the lightning and the thunder? A bright boy will almost certainly ask such questions, and many more like them, which father or mother must answer for him, or he will need some work on meteorology, like that of Brocklesby or Loomis, in either of which he will find such questions answered, and also much about the principles and uses of the thermometers, barometers, and other instruments used in weather observations. He may also obtain information in regard to the Signal Service; what it aimed to accomplish for mariners, and for farmers, and upon what its weather predictions are based.

When one begins to study the weather in earnest, many questions will naturally arise in regard to the sun, the moon, and the stars, and the fanciful arrangement of these latter into constellations. In all ages men have looked up to these bodies with wonder and admiration. Some of the oldest records of the past tell us of observations and speculations about the stars, and their supposed influence upon human life. The geography of the heavens is an attractive study to most boys and girls, and some good astronomy, like Proctor's or Lockyer's, as it comes in their way, is almost certain of attentive perusal. Such books will explain the changes of the seasons, and the causes of many strange phenomena, both of earth and sky. Then the lives of Hipparchus, Ptolemy, Copernicus, Galileo, and of Sir Isaac Newton, the men who have taught us what we know of astronomy, will be read with interest.

The boy on the farm who endeavors to obtain an intelligent idea of everything about him will be sure to ask many questions which come within the domain of what has been called Natural Philosophy, now oftener Physics. He will want to know about the material of which the things he sees are made, and may soon learn that matter exists in three forms—solid, fluid and gaseous, —and he may learn the properties of each. He sees that matter may be at rest or in motion, and that which he sees in motion he learns to call force. Perhaps he learned to think of its different manifestations as physical, chemical, vegetable and animal force. He may see how force is applied to accomplish certain results through the agency of what are known as the mechanical powers, the lever, wheel and axle, pulley, inclined plane, the screw, and the wedge. He is already familiar with these, for he takes a lever to move a log, he sees the advantage of the wheel and axle in the wagon and cart, the wedge he uses to split wood, and the inclined plane, and the screw, and the pulley are almost in daily use on the farm. Then, if a good work on Physics, such as Stewart's *Sessions in Elementary Physics*, is put into his hands, he also learns about gravitation, attraction, cohesion, and about sound, heat, light, electricity, magnetism, etc. As the boy becomes interested in the principles of mechanics, he will be sure to want a work bench and tools, and try to make or mend articles in common use.

The boy gets up in the morning and makes the fire, and as he watches the burning he may ask himself what is this process of combustion as people call it? He washes his hands and asks himself why the soap assists to cleanse them. Perhaps he helped to make the soap, then he wants to know why the lye leached from wood ashes unites so perfectly with the grease, and why soap possesses properties so different from the substance of which it was made? If

he lives on a dairy-farm he sees rennet put into milk which it soon coagulates, and the curd separates from the whey, and then a cheese is made, how does the rennet produce this effect? In bread-making, yeast or baking powder is added to the moistened flour to cause the liberation of little bubbles of gas which lighten up the dough so that when the bread is baked it comes from the oven light and spongy, why is this? If cider is made he watches the process of fermentation, and finds that the liquid gradually becomes less sweet, at the same time that it acquires an intoxicating quality, then he is ready to seek an explanation of this process of fermentation. Now, if he is so fortunate as to get hold of an elementary chemistry he may learn something about all these processes, that whatever he handles, is made of one or more of some seventy different elements in various states of combination. He learns the names and properties of these elements, and how they unite to form the substances with which he is most familiar. Chemistry he soon sees can be very helpful to a farmer, it teaches of what soils are made, and what in any particular case must be added to insure greater fertility. It also shows the composition of fertilizers, and how to estimate their value; it explains the composition of foods, and teaches what proportion of their constituents should be used to secure any result desired. It is not necessary here to dwell upon the incalculable value of chemistry in the arts, and in medicine; it is sufficient for the young farmer that he appreciates its value in agriculture.

You must not understand that these branches of natural history must necessarily be taken up and finished in the order in which they have been named; on the contrary, several of them may be begun, and each one may receive attention from time to time as questions or materials present themselves. Then there are portions of every year, especially in the winter months, when other studies may be pursued with greater advantage than any of these branches of natural history.

The boy or young man may feel the need of mental training, and the question arises, Is the mind to be trained as a whole, or does it consist of distinct faculties which require separate attention? He perhaps recognizes that in his own mental states and operations he has found himself thinking, feeling, and willing, and so readily understands the distinction of intellect, sensibility, and will. At the very foundation of his thinking, he is conscious of expressions made by objects through sight, hearing and other senses; these impressions arouse attention, and then the object is carefully examined in its qualities and in its relations, gives a more or less distinct idea, which is then ready to be stored away by the memory. The memory appears to have a way of holding on, or of letting go, which depends very much upon the clearness with which things are apprehended, and the manner in which they are associated and stored away. One person pays no attention to this storage, and his daily acquisitions are soon lost; another stops a moment when his attention has been arrested, and asks himself, what is it? is it like or unlike what has been already learned? will it be useful when this or that subject comes up for consideration? Then he hangs it on that peg, so to speak, where it will be found when wanted. The imagination seems to him a wonderful faculty, for it enables one to pick out any of the materials stored away by the memory, and to reproduce them in new forms and combinations. In proportion, as this faculty has been developed, the pictures or scenes it portrays may be less or more perfect than the original. Another faculty is the reason, which if sufficient care be used, enables one to step safely from the known to the unknown. One way of doing this is by what is called *analogy*; for example, a boy eats too many unripe apples, and after a short time he suffers from colic, perhaps when opportunity offers he does the same thing again, and again he suffers, but

by and by he reasons that when similar causes are brought into operation, similar effects may be expected, so he learns to restrain his appetite. Another process is called *induction*. One reads of the people of past ages. Where are they? All dead. The patriarchs spoken of in the Bible are said to have lived to a great age, yet in each case the story ends with "and he died;" so of many of the old people whom we have known. Taking all these particular cases into account, we reach to the conclusion that everybody dies, or in other words, that "man is mortal." Another step in the exercise of reason is called *deduction*. By this process we see that when a general law is fully established we may apply it to particular cases as they arise, thus if it be accepted as a general truth that "man is mortal," then sooner or later we ourselves will all cease to breathe, and this suggests to us the propriety of working diligently while it is called to day, "for the night of death may soon come in which no man can work." This form of reasoning is especially employed in mathematics as when an established principle is used in the solution of particular problems. This is a very brief and inadequate idea of the scope and value of mental philosophy, or psychology, as it is often called; but with a good text-book the subject will be found intensely interesting to those who wish to understand the operation of their own mind, and it will be almost a necessity for such young gentlemen and ladies as expect to engage in teaching. For the use of such, James Sulley has prepared a work on the Elements of Psychology, with special reference to the art of teaching. The laws of thought, or the right use of reason are still more fully explained in text books on logic, and the young man who starts out with a determination to learn all he can, will do well at an early day to make himself familiar with logic, or he may spend much time or strength unprofitably.

Making an inventory of his available means of influence and usefulness a young man will be likely to see that in whatever business he engages he will want to know how to write and speak acceptably. The farmer, if he possesses such ability, can use it to as good advantage as any one; it is therefore worthy of his attention. To obtain some readiness and accuracy in thinking, writing, and speaking, it is usual to make a special study of rhetoric; this science teaches how to make choice of words, how to use figures of speech, the meaning and quality of style, the use of arrangement and adaptation to purpose, the value of clearness, force and elegance, and whatever goes to make an entertaining, instructive and convincing essay or address. As already stated there are seasons of the year which are not so well adapted to the study of external nature, and these seasons may be delightfully employed by the farmers' sons and daughters in such studies as history, psychology, logic, rhetoric, etc.

I will now refer to some of the less agreeable features of farm life, and, first, it is said to be unsocial. Farmers' houses are usually some distance apart; their business does not bring them into frequent contact with their neighbors, and this isolation often proves a temptation to carelessness in dress and manners. Where people lack the stimulus which society affords, they are apt to become listless, and to lose interest in what does not pertain to the farm or the home. To remedy this tendency, the Grange has been devised, and as a means of intellectual and social culture for farmers' families, it would seem to be invaluable. Farmers should not shut their eyes to this unsocial tendency of their occupation; on the contrary, let us consider it squarely, and like sensible men and women do our best to correct the evil. Granges, scientific or literary associations, or libraries, or whatever is best adapted to the tastes of a locality should be cordially and energetically sustained.

Farming is a laborious occupation; some feel this to be a serious objection to an agricultural life. But does not labor develop strength? The labor of

the farm is so varied that every muscle in turn is brought into action, and not only strength, but symmetry, and great powers of endurance are the result; so that if farm work is laborious, it has ample compensation in the strength and health which it brings. Steady work secures the regular elimination of the waste matter from the system, so that a hard working man may keep himself healthy and wholesome, while this cannot be said of a lazy man. Labor is not the curse that has been supposed. Man's powers of body and mind were manifestly formed for work, and when thoroughly used are most apt to be kept in a desirable condition.

It has also been charged against farming that it is a slow way to make money. Admitting the fact, we may take comfort in knowing that man does not live by bread alone; more than the wealth he might accumulate, a man should value the good he may do, and the manly and honorable character he may secure. Farming does not promise the easiest or most rapid way of making a fortune, but it has not been shown that it is not a most excellent way to make a man. If the question be narrowed down to this, what occupation in life may we expect to be most conducive to the formation of a thoroughly manly character; I can think of nothing which promises better than the occupation of farming.

To recapitulate, I have endeavored to remind you that farming is an honorable, and healthful, and a remunerative industry. More at length, I have attempted to show our young friends how the farm supplies a starting point, and a pathway to valuable knowledge and mental training. If parents feel that their own education is deficient, and they cannot give to their children the help they need, they still may in almost every case give them the benefits of the common school, and perhaps further encourage them by supplying the books they will need for home study, or young people may be sent to the State University, where they can soon learn what is worthy of their attention, how to study and where to begin. I have also briefly considered some of the common objections to a farm life, such as that it is unsocial, laborious, and slow. The first of these, I think, has force, and, therefore, I have urged the use of such remedies as the Grange, and scientific, and literary classes. Such organization I regard as indispensable in every farming community. In regard to the objections that farming is laborious, and a slow way to acquire wealth, the force of these is not so apparent, and work in itself is not an evil; and although farming may be a slow way to make a fortune, it is a sure way to make an honest living, and that is better for a man and for his family than any gilded and questionable uncertainty.

DOMESTIC SINS.

BY JAMES L. TAYLOR, M.D.

[Read at the Farmers' Institute, Haverhill, Ohio, January 15, 1886.]

Away back in the days of our great-grandfathers, when books were scarce and newspapers less plentiful than to day, there was widely distributed throughout the colonies a little pamphlet full of terse maxims and proverbs designed to teach lessons of thrift, prudence, and economy; in short, adapted to show forth how best to get on in the world. This little publication became widely popular, for it contained such maxims as, "He that would thrive, must ask his wife," and

from this grew the common style of answer, when one's consent was asked to any measure of doubtful expediency, "I'll ask my wife about it." This ready deference to our goodly great grandmothers acted like a charm. The little pamphlet soon found its way to every fireside. It was reprinted in Britain, translated into French, bought by the clergy for gratuitous distribution among their parishioners, and reached, for those times, the enormous annual circulation of ten thousand copies. The poor people read but little else, and its author believed that in Pennsylvania, as it discouraged useless expense in superfluities, it had a large share in producing that growing plenty of money observable for many years after its publication. I need hardly say that I allude to Poor Richard's almanac, printed by Dr. Benjamin Franklin.

Notable among the proverbs of homely wisdom to be found in its pages, and which most of you have heard was this: "Early to bed and early to rise makes a man healthy, wealthy, and wise." In this maxim, the great American philosopher, as you observe, places health before both wealth and wisdom; and hence, in the light of his illustrious example, I have thought it might not be amiss, while our friends from abroad discoursed to us about these latter themes, to give you some of the results of my observation and experience touching a few of the mistakes of our daily life, affecting the health and constitutions of ourselves and children.

Foremost among our domestic sins is that of intemperate eating, and by intemperate eating, I mean eating too much. It is within the bounds of moderation to say that four people out of every five over eat habitually, and it is chiefly because the evil consequences of over indulgence at the table are so little understood that we take but little pains to observe moderation. If all the diseases and ailments growing out of over repletion were well understood, no words of mine would be necessary to enjoin abstinence. But, unfortunately, most people get their ideas of health and disease from the makers of multitudinous patent medicines, which are annually consumed in this country by hundreds of tons. Circulars, advertisements, and almanacs abound everywhere. Each one assumes to give a learned explanation of the cause of every disease which his particular remedy infallibly cures. And it is from these sources, these interested, designing, catch-penny advertisements that most of us get our medical ideas. In my practice I was greatly puzzled for a time, during the past few years, to account for a fact which seemed to me most unusual and unheard of, and that was the sudden and alarming increase among the people of kidney disease. On all sides I began to be told that this one, that one, and the other one were suffering from kidney trouble. People who had indefinite ailments, and whom I did not consider seriously sick, kept telling me that their kidneys were affected. Finally, I took to inquiring how they knew that they had this serious disease? Well, they had all the symptoms of it. "But how do you know," I asked, "that your symptoms mean kidney disease?" "Well, its just like the descriptions given of it in Warner's Safe Kidney Cure, and I know I've got it." And so the mystery was explained; and I had the satisfaction of knowing that I was not the only one who had been beguiled into reading Warner's taking advertisements. It reminds one of the old darkey woman who went to the doctor for a plaster, on account of a powerful spell of rheumatics in her back. The doctor got a plaster and wrapped it up for her in a piece of brown paper. On going out of the office the plaster slipped out of the wrapping paper unobserved, and the doctor picked it up and replaced it in his drawer. In a few days his patient returned and asked for more of that plaster what looked like brown paper. The doctor asked if she had applied the plaster according to directions. "Oh, yes, I wet it and stuck it on like you tole me, and it hoped me powerful. It am de drawinest plaster eber was, and if I get one more like dat, I be done cured, shuah."

"Catching cold" is supposed to be the fruitful source of most of our common ailments. If I were to tell you that catching cold is, in many cases, the result of over-eating, I should no doubt provoke a smile of incredulity. Nevertheless, the weight of highest medical opinion to day favors this view. The old idea about colds was, that they were caused by dampness or draught of cold air chilling the surface of the body, closing the pores of the skin, and causing an inward congestion. While this is in many cases true, yet it is only part of the truth, and perhaps but a small part. Perhaps most of you have observed that very few people take colds when there is a sudden change ushering in a cold spell of weather. In the most extreme changes of this kind, although people may go about shivering and complaining, yet very few take colds. On the contrary, nearly every one feels invigorated, braced up. Most people can recall periods in their lives when they have suffered with cold for a long time continuously without "catching cold." So that a chilling of the surface of the body is by no means the most frequent cause of this common ailment. In fact, colds are oftenest contracted when the weather changes from cold to warm. At such times you may have noticed whole neighborhoods, in church or at school, snuffling and barking in concert with each other. In these cases the theory of a chilling down of the surface of the body evidently does not apply. Some other cause must be sought for. And we find one that is all-sufficient and perfectly philosophical in the theory of over-feeding.

Without going into the technicalities of physiology, I may remind you, briefly, in explanation of this view, that the system is every day compelled to throw off and get rid of an amount of worn out material just about equal to what is taken on in the way of food and drink. This process of elimination is carried on partly by the skin, but mostly by the mucus membranes; that is, the membranes lining those cavities of the body communicating with the air, as the nose, mouth, throat, lungs, stomach, bowels, kidneys, water passages, etc. When the process of digestion and assimilation exactly balances that of elimination, every thing goes on in the harmony of perfect health. But when more is taken into the stomach than the system needs, extra work is thrown on these mucus surfaces to get rid of the surplus, and this causes a congestion. When this congestion strikes the upper air passages, as it most generally does, we have a catarrh of the nose and throat, and this is but the medical name for a common cold. In cold weather the appetite is increased, the system needs more food to assist in keeping up the required bodily heat. But when a sudden change takes place to warmer weather, there is an accumulated surplus of food within the system which is now no longer needed. This must be gotten rid of, and it is this overwork falling upon the mucus membrane during these warm changes which so frequently causes neighborhood colds. When these become frequent and persisting, we have that disagreeable disease commonly known as "*The Catarrh*," a disease which exists to a greater or less degree in almost every family. But this overloading of the stomach does not always take the form of a cold, for we have catarrh of the stomach, or dyspepsia, catarrh of the bowels, of the liver, the kidneys, the bladder; indeed, of all the mucus surfaces. Perhaps nine tenths of the ailments which the physician is called upon to treat are catarrhal; and you will observe about the first thing he does when summoned is to administer a good brisk cathartic to unload the system. There are some people who could not live without a box of liver pills or blue mass in the house. They are always bilious. Their livers are naturally torpid, they think, and they need a frequent stirring up to get rid of the bile. Now, nineteen times out of twenty you will observe that this kind of people sit too long at the table. They may obey the scriptural injunction, "to watch and pray," but they always forget to fast. Wherefore, I take it that eating too much

is a serious domestic sin, for which our good wives are, in part, responsible. For do they not continually multiply the number of delicacies set before us, tempting our palates with luscious dainties long after the real cravings of the healthy stomach are more than satisfied? I read of an ordinary family gathering the other day at which there was a feast prepared, consisting of seventeen courses, and the servants carelessly omitted another course, which would have made eighteen in all. And yet people will rise up from such gormandizing, and complain that we live in a very bad climate. What wonder that they want catarrh medicine, and liver pills, and safe kidney cures, and all that. When we recall Franklin's fare at breakfast, consisting of "a large porringer of hot water gruel, sprinkled with pepper, crumbled with bread, and a bit of butter in it," which he called a comfortable, cheap breakfast; or Jefferson's inflexible rule of daily life, always to rise from the table feeling that he still had an appetite for more; or the established habit of General Sherman, that tough, wiry, indomitable man of iron nerve of our own day, who maintains a vigorous old age on only two meals a day, we are reminded that the world's greatest thinkers and workers have been temperate at the table.

But catarrhal diseases which, as I say, constitute about nine-tenths of our ordinary ailments, especially in this region, frequently arise also from improper protection of the skin. If you will take the trouble to examine the skin of a healthy person you will observe that it is soft, pliable, and oily; one of its secretions, as you know, being oily, designed to protect it from the changes of the weather; while an old enfeebled person, especially one suffering from pulmonary disease, or from any wasting affection, has a dry, harsh, branny skin, a condition exactly the opposite to what we find in vigorous health. Curiously enough, we learn that oiling the body or anointing it has been practiced as a sanative measure among Oriental nations, from the earliest times. The observance of this custom was considered so important that finally it became incorporated into many religious systems; even our own sacred terms—Christ, Messiah—mean "the anointed." As a hygienic measure, it was practiced in connection with baths, for the purpose of closing the pores, repressing undue perspiration, and so preventing loss of strength. It was also regarded as a protection against the heat of the sun, and a prevention from catching the plague. Certain it is that oil would not be poured out from the millions of pores in the skin to lubricate the surface of the body, if it were not needed. Hence, common sense would dictate that we follow nature more and fashion less in the protection of our bodies. The question should be, what kind of clothing will best insure an adequate supply of this oily secretion, and afford at the same time comfort and protection to the surface? Undoubtedly, all wool flannel best answers every requirement of the system. It permits the ready escape of all the watery vapor from the surface of the body, while the oily secretion remains, keeping the skin pliable, soft, and natural, thus affording the most perfect protection we can have against damp, chilling changes of weather. Hence, I take it that there may be such a thing as too much scrubbing and scouring of our bodies, especially in the case of children. I believe that the extra care which many loving mothers bestow in daily baths and scourings is most pernicious, making the children tender by a too constant opening of the pores, when the protective oily secretion is daily washed away. So that there is perhaps more sound philosophy than prejudice in the common notion that the little fellows who are not altogether strangers to a little dirt, often thrive best.

Cotton, or Canton flannel, so often worn as underclothing, is, perhaps, the very worst material in common use. When the knap becomes saturated with moisture, it is slow to dry, and thus acts as a wet blanket to the body, abstracting the heat, imprisoning the secretions, and insensibly lowering the

vitality of the body. It is not the sudden change from warm to cold which brings disease. Dry, cold weather, we all know, is most healthful and stimulating. But to sudden cold let there be added moisture, and sickness is almost certain. Thus, a wet soil, water in the cellar, moisture from constantly scrubbed floors, dampness of newly plastered walls, or the perspiration of the body held in cotton garments—these conditions, joined with sudden changes, are what destroy health. When to this is added fatigue from over-work, which still further incapacitates the system for resisting disease, the formula for populating grave-yards is about complete. Let me give a case in point. A young man, in the full glow of health, eighteen years old, became overheated and exhausted by running through the cornfields after cattle in hot summer weather. He then climbed the fence—hot, perspiring, and worn out—to rest. He became chilled, and, within a few hours, sore throat set in. A day or two afterwards, I was called to see him, and found the most malignant case of diphtheria I ever saw. In two days he died. There had been no diphtheria in that family, nor in that neighborhood for years, so that the proof is absolute that this most deadly disease may originate from the conditions I have mentioned. Woolen undergarments, then, are what everyone should wear in this climate—summer as well as winter; and when I say wool, I mean the fibre that grows on the back of the sheep. For, when we buy wool of the farmer, we get wool; but when we buy wool of the dealer—alas! alas! we get something whose composition no man knoweth. Last spring, I saw a young woman who was burned to death by the accidental firing of her clothing from a brush-pile in the field. I remarked that if she had been clad in flannel this would not have happened. But her parents assured me that her dress was woolen, and all her underclothing flannel. They meant, of course, the kind of flannel we buy; for everyone knows that the clear wool would not have blazed up in a moment, enveloped the body as this did, and burned the head, neck, arms, and body, so that death should result before the parents, who were near by, could extinguish it.

Another very common mistake noticeable in many households, is the practice of keeping the living room constantly too warm. This is not so apt to be the case when grates are used as when close stoves are the medium for heating. It is a hygienic fact that heat is debilitating. People who follow occupations which subject them to constant high temperature, seldom live to be old. The inhabitants of hot climates are less robust than those who dwell in higher latitudes. A hot bath soon produces nausea and fainting, while a cold bath, under proper conditions, is invigorating. Most rooms heated by close stoves are kept at a temperature of from about 75° to 80°. When the inmates of a room like this go out into the cold air, the contrast is sudden and extreme. Unless they have robust bodies and go unusually well protected, they contract pneumonias, sore throats, winter fevers, and kindred ailments. Experiments made by health officers in private schools in Boston, show that a uniform temperature of 65° is all that is desirable for healthy people. At first, it is felt, by many, to be cool and uncomfortable. But soon the system becomes accustomed to it, and the sick list among children in these schools is remarkably reduced; colds, sore throats, and irritating coughs being almost unknown among them. Let one who lives by an open fire go into one of these super-heated rooms with a close stove, kept at a red heat most of the time in cold weather, and a headache almost invariably follows. Now, if this occurs in the case of a transient experience of only a few hours, what should we expect to find among those whose lives are passed in over-heated dwellings? Within the range of my observation, I can recall but very few families living in rooms heated by close stoves, who have not more or less head or throat troubles. An

open fire-place or grate furnishes, not only constant ventilation, but a more even temperature, and an atmosphere which does not dry and parch the lining of the nose, throat, and lungs; and headaches, if they occur, are not the result of breathing an air coming from red-hot plates of iron. But in these matters we all know better than we practice. The force of habit rules our lives. It is like the lady who went down South to labor among the colored people in the interests of the Freedman's Aid Society. Filled with the spirit of Christian benevolence, she decided to organize an infant class in their colored Sunday school. So she collected about a dozen pickaninnies out of the alleys and byways, and began the process of civilizing them. The first Sunday she thought it sufficient to drill them on the subject of the creation, and consumed the whole time telling them who created the world, charging them that this would be one of the leading questions again on the following Sunday. The next week, the first question was: "Now, boys, you remember I told you, last Sunday, who it was that created the world, don't you?" "Yes, maam." "Well, all that can answer that question to-day, hold up your hands." All hands up. "Well, boys, I'm glad you've given such good attention to the lesson. Now, then, answer in concert—altogether; who created the world?" "ABRAHAM LINCOLN!"

In an admirable address delivered by Dr R. L. Collier, to the Young Men's Business College of Poughkeepsie, N. Y., entitled "From the Anvil to the Pulpit," in which he tells of his rise, from a poor boy in England, working at the forge for fourteen hours a day, to the pulpit which he now occupies in New York City, he says in special stress, in accounting for his promotion in the world, upon the fact of his being *well bred*; not well bred in the sense of having an illustrious ancestry, like the Phillipses and the Quincys, but well bred in the sense of having inherited a body capable of work: tough, enduring, invulnerable to disease. Never sick, and able to accomplish as much work as two ordinary men. This he calls being well bred, and his fine physical frame he credits mostly to his mother who, in their little household, he says, "could make things snap and boom, and who contrived to keep her house and raise her boys on \$4.50 a week." His having had a vigorous, healthy parentage is what Dr. Collier chiefly credits with giving him an advantage over other men, so that, although they could not afford to send him to school after he was eight, he could yet do his daily work, and educate himself besides, until he was prepared to step into one of the foremost pulpits of the world. Now, this is the kind of breeding which every parent, to the full extent of his or her ability, is in duty bound to transmit to their children. It is worth more than schools or colleges, than fine manner or good clothes, than broad acres or worldly possessions of any other kind. For it means, more than any other one thing, happiness, content, success in life, and length of days. When people set about making improvements in their flocks and herds, they are at great pains to secure the transmission of desirable qualities. A healthy stock is then a matter of prime necessity. In these petty, trivial affairs, comparatively, there is no end of trouble and expense to make happy selections, and insure the propagation and transmission of higher qualities. All the world recognizes its importance, and sanctions the aims and purposes of those who give these matters most attention. But when human beings meditate a union, which implies in many cases an accommodation of tastes and dispositions as diverse as the antipodes, which means the foundation of a family, and which suggests consequences and results extending perhaps many generations in the future, what an utter absence is there of all care that the families of the future shall be well bred. Is the choice of the average young man or woman determined by the offer of those qualities which, like plain colors, often wear longest,—by tem-

perance, industry, honesty, frugality, and a sound mind joined to a sound body? How little these staying qualities have to do with influencing the choice of most young people, I leave you to judge. But certain it is that the neglect on the part of parents to emphasize and insist upon the frivolity and folly of the current flash and fashion of the day, too often leaving their young people to be dazzled and misled by the glare and tinsel of misapplied wealth or worthless foppery, is indeed one of the gravest of domestic sins. It is due to every child born into the world to be taught and thoroughly indoctrinated into the idea that work, persistent, patient, steady work in some vocation, is at the root and foundation not only of all true worth and excellence, but at the very source of common physical happiness and well being in this life. And when once a person accepts, without reservation, this interpretation of his destiny, the hardest lot becomes softened.

Finally, next to a sound body and a willing mind, a spirit of sturdy self-reliance is of incalculable value to every person who has ambition above being carried and coddled through the world. And this is largely a matter of home education. The schools can not give it. The man or woman who has not been trained to plan and to act, will seldom know how to plan and to act. Men sometimes make the mistake of leaving their farms to go into the towns to educate their children, thereby depriving them of the inestimable advantages of a home training in industry, and in all those activities which develop a spirit of confidence and self-reliance which the most favored schools are utterly powerless to bestow. Hear what a well known man says of his boyhood: "When I was seven or eight years of age, I began hauling all the wood used in the house and shops. I could not load it on the wagons, of course, at that time, but I could drive, and the choppers would load, and some one at the house unload. When about eleven years old, I was strong enough to hold a plow. From that age until seventeen, I did all the work done with the horses, such as breaking up the land, furrowing, plowing corn and potatoes, bringing in the crops when harvested, hauling all the wood, besides tending two or three horses, a cow or two, and sawing wood for stoves, etc., while still attending school. I did not like to work," he adds, "but I did as much of it while young as grown men can be hired to do in these days, and attended school at the same time." Of course, you recognize in this description the lad U. S. Grant. Many parents might think, if they should subject their boys to this kind of an ordeal in these days, that they were not giving them a fair chance in the world. But this very discipline strengthened and developed his native self-reliance, training him early to decide and to act on his own judgment, thus qualifying him in latter years to assume the most gigantic responsibilities, though opposed sometimes and dissuaded by a whole conclave of subordinate generals. When he went to West Point, Sherman says of him that "no more unpromising boy ever entered the Military Academy." That was as far as Sherman could then see. This trait of self-reliance which he then possessed in a supreme degree, and which was destined to distinguish him from all other men, was yet invisible. The only faint clue by which it might be inferred was that he excelled all other cadets in horsemanship. Of course, all can not become Grants. But we may be sure that the early training which contributed to mould a man of such a pattern, was a good discipline. We may be sure that when we coddle our girls, and indulge our boys, lifting from their shoulders, often with our own hands, the drudgery of the kitchen or the distasteful routine work of the farm, we are denying them the most valuable part of their education. We are dwarfing their capacity to think and act independently. We are handicapping them for that earnest life-work which is the inevitable destiny of every right-minded person. We are sending them forth

shorn of that strength, inurement and self-reliance which some other seemingly less-favored person may chance to have, and thereby distance them in the long, toilsome journey which, in some capacity or other, we are all destined to make together.

SANITATION ON THE FARM.

BY R. HARVEY REED, M.D., MANSFIELD, OHIO.

[Read at the Richland County Institute, Mansfield, and published by request of the audience.]

About sixteen years ago the importance of legalized sanitation was first recognized in Massachusetts, when the first State Board of Health was organized in the United States

Two years later a few gentlemen, interested in sanitary science, met and organized the American Public Health Association; and each year, ever since, this Association has met in some of our larger cities and discussed practical sanitary matters, until to day its influence is felt throughout the entire civilized world, and as the fruits of its earnest labors thirty one States of this prosperous Union have passed laws creating a State Board of Health, for the prevention of the spread of contagious diseases, and for the protection of the lives of their citizens.

It will be observed that sanitation is comparatively a new science in this country, and while the same laws of disease and death have existed ever since our Creator pronounced the curse on the heads of our first parents, yet the study of these laws seems to have been left for this generation.

It is true, Moses laid down many laws for the sanitary protection of his people, which, in their crude way, were of great value to the Israelites of those days; yet his knowledge of the causes and spread of contagious epidemics, that destroyed their victims by the hundreds of thousands, and in many instances almost depopulated whole empires, and the methods of staying their ravages was almost nothing.

While the strict application of sanitary laws are most needed in our great centers of population, yet the knowledge of sanitary science is just as essential to the farmer as to the townsmen.

While the chances of unsanitary surroundings are very much less naturally in the country than in our cities, yet there is no reason why a proper knowledge of law to protect the health is not proportionately as essential to the farmer as to the citizen of our larger cities and towns.

The increase of population proportionately increases the danger of contamination and the spread of disease from unsanitary surroundings, and lessens in the same ratio nature's methods of sanitation.

The new country has its sanitary "drawbacks," which are most frequently found in some form of malarial troubles, which very greatly diminish with the cultivation and tiling of the soil, and the proper drainage of the land. On the other hand, the old settled districts must guard against typhoid fever and allied diseases, which are propagated more readily in the older and more densely populated districts.

All these are merely hints throwed out to call your attention, as a body of intelligent farmers, to the necessities of sanitation on the farm. It would be impossible for me to go into the details, or take the time to prove to you by

experts the assertions I have made here to-day. Yet they embrace principles which are founded on proven facts, the outlines of which I wish every farmer in the State of Ohio knew and would put into practice, for if they did it would save thousands of valuable lives annually.

THE HOUSE WE LIVE IN.

No persons, as a rule, have better opportunities for selecting choice sanitary locations for the erection of their dwelling houses than farmers, and yet how few avail themselves of the privileges nature has extended to them.

The site for a home location should be dry, and so situated that the prevailing winds of that vicinity would not blow from some marsh or swamp to the house. The natural drainage should be such, if possible, as to free the soil from all "ground" water, and leave it dry and porous, or "warm" as we sometimes call it. Stagnant water, even hidden away out of sight in the ground, is as injurious to the health as that which stands covered with green scum" in the so-called "cat swamp" of the woods and fields. If the natural drainage is not such as to secure this condition, see that your location is where natural drainage *will* secure it.

A gravelly soil is preferable to a clay, and a clay is much better than a soil loaded with organic matter in various stages of decomposition.

While comfort and appearance should be consulted in the construction of a house, the ventilation, heating, and lighting are of much more importance.

The habit is too frequent of building houses with little 8 by 10 rooms, with low ceilings and one window, with no provision for heating for a bed room to be used for bed rooms for the boys or girls. In such rooms two beds with two lodgers in each are often crowded. This practice cannot be abandoned too soon. Every room should be built with suitable arrangements for thorough ventilation; by this I mean that at least five hundred cubic feet of fresh air be admitted to a room every hour for one person; that is, to say, an ordinary bed room, such as is frequently found in our farm houses 10 by 12, with an eight-foot ceiling, counting 960 cubic feet of air should have the air in it completely changed every two hours for one occupant, and every hour for two occupants.

Many good authorities claim that even much more fresh air than that is necessary, setting the amount as high as 2,000 cubic feet for one person every hour. Yet how few of our country bed rooms are supplied with fifty or even twenty-five cubic feet of fresh air every hour, especially during the cold weather, and that must be divided up very often among three or four persons.

All direct drafts should be carefully avoided in ventilation. The common custom of opening a window opposite the head, foot, or side of a bed, so that the draft blows across the bed in some way or other, is very objectionable, while at the same time it must be remembered a single window open in a room only very imperfectly ventilates it.

A room should be so constructed as to secure a sufficient supply of fresh air to all parts of the room without a direct draft to any part; and when desired, so arranged as to supply any required amount of heat, equally distributed to all parts of the room, or nearly so.

Every room should be so arranged that the "light of Heaven" can shine unobstructed into it during some part of the day. Plenty of God's sunlight will hurt no person; but on the contrary, when combined with good ventilation, it will prevent this oppressive, musty smell we so frequently notice in the bed rooms of many of our citizens, and especially in the sitting rooms of many of our farmers, as well as fellow-townsmen. This musty smell is always unhealthy, and no room with it in is fit for human beings to live in; yet from five

to seventy-five per cent. of all our houses will furnish us one or more rooms of this character, and at the same time their occupants are puzzling their brains to discover the cause of their frequent attacks of sickness.

The cellar should be kept as clean and dry as the kitchen. Damp cellars have caused the premature death of thousands of our citizens, while rotten cabbage, potatoes, apples, and vegetables of all kinds in the cellar serve to add fuel to the fire of human destruction. Build your cellar so that you can keep it dry and clean, and then see to it that it is dry and clean, with plenty of ventilation. If from any reason you cannot build a cellar under your house that will be dry, build your house without a cellar, and so arranged as to be thoroughly ventilated under the floors, and build your cellar above ground; indeed, I prefer such a cellar for various reasons, if it can be arranged for. Really the only excuse we have for an underground cellar is economy of space and convenience.

ARTIFICIAL SURROUNDINGS.

The artificial surroundings of "the house we live in" should be so located and arranged as not to interfere with the sanitary conditions of the house.

THE BARN.

The barn should be far enough away to dilute, and, if possible, so located that the prevailing winds will not carry the gasses of decomposing manure in the direction of the house.

It should be built so that any part of it, and especially those departments intended for stock, may be well ventilated and supplied with abundance of light. Stock needs pure air and light to be healthy, as well as man. Unhealthy stock is unprofitable merchandise for the farmer, to say nothing of the fact that those used for food are unfit for man's use.

HOG PENS.

It would be a blessing to America to day if what is commonly known as a hog pen were unknown.

The prevailing habit of crowding a lot of hogs together in the smallest possible inclosure, with little or no thought as to their comfort and much less to their cleanliness, and compelling the poor brutes to wade, sleep, feed, drink, and live in their own filth, to which is added all the filth and garbage of the farm, simply because he has vitality enough to endure it, is not only cruelty to animals, a disgrace to those who allow it, and unsanitary in the extreme, but a national loss, financially.

To expect a pig to grow into the healthiest possible hog when it is never permitted to breathe a breath of pure air, or drink a sup of pure water, or eat a mouthful of clean food, or take a particle of healthy exercise, is just as unreasonable as to expect slop to turn into ice-cream, or sewerage into healthy drinking water.

If the farmers would raise their hogs in open fields or timber lands, with plenty of fresh water and abundance of healthy, clean food, they would very greatly lessen the percentage of trichinæ and "measly" pork, and thus lessen the dangers in the use of hog-meat from the various diseases it is prone to, and thereby increase the demand for it.

The habit of fattening hogs on the rotten offal of the butcher's shop or slaughter house cannot be condemned too severely. Such meat is but little

better than that of the hyena or vulture, and its sale should be suppressed by rigid laws.

The foul, stinking, unhealthy hog pen should be replaced with a clean, dry shed, bedded with clean straw or leaves, kept free from fleas and similar vermin, and so located as not to contaminate the air of the house under any circumstances. Fortunately, in our great pork-producing regions, good food, good shelter, and cleanliness are the rule.

WATER CLOSETS.

The water closets are an important feature of our homes, especially from a sanitary standpoint.

The prevailing idea that they can be stuck around out of the way in any place, built in any manner, and cleaned once or twice in a life-time, is a mistaken one.

There are various ways of constructing these commodities, and on their construction should depend, to a certain extent, their location.

The common habit of building a shed over a hole in the ground is objectionable in various ways:

- 1st. They are hard and difficult to clean.
- 2d. They are apt to gather and contain filthy, stagnant water.
- 3d. The water is liable to percolate through the soil into our wells, and contaminate our drinking water.

If vaults are used at all, they ought to be so located that their contents can not percolate into our wells or cellars under any circumstances, and so constructed as to be water tight; and they should then be cleansed at least twice a year. They should be disinfected frequently by the free use of *common road dust*, which is the cheapest and the best, or slacked lime can be used; either of which should be used often enough to destroy all the offensive odor so common to these adjuncts of civilization.

A better plan is to not have any vault at all. Build your house so that the discharges, which will drop on top the ground, can be easily got at and removed frequently, and used for compost on the farm; with which plan the dry road dust should be used freely enough to control all the odor, and when this cannot be done, they should be cleaned out at once.

Others may prefer to have a tight, strong box to serve as a vault, built on a low sled, and so constructed as to attach a horse and draw to a suitable place for disposal, and when emptied, returned to its place again. This plan avoids duplicate handling of the contents, is cheaper than a vault, much more easily kept clean, and makes it more convenient to dispose of the contents; which can be kept disinfected as above described, and thus avoid the unhappy results arising from the old plan of constructing and maintaining privies.

WATER SUPPLY.

Wells and springs are dangerous luxuries; the ease with which their contents can become contaminated makes them objects to be dreaded rather than to be encouraged. The more thickly inhabited a country becomes, the more danger there is of contamination of these natural and artificial water supplies. If it is a spring, it is usually located in some ravine, and constantly liable to overflow at every freshet, and the introduction of "wild water" filled with organic matter of all descriptions.

There is scarcely a year I do not see one or more members of a family

stricken down with typhoid fever, or some other low form of fever, which is directly traceable to this cause.

Barn-yards, hog pens, and privies are often so located as to readily drain into the spring with each shower; while too often ducks, geese, frogs, and dogs make them their common watering place.

Wells, on the other hand, are too frequently located for convenience, and when securely covered out of sight, and furnished with a pump which throws plenty of clear, or moderately clear water, are supposed to be a safe luxury; while in reality they are the receptacle of filthy water charged with organic matter, or furnish a watery grave for rats, mice, rabbits, and even young pigs and chickens, which are generally first discovered by the sense of smell and taste, and which, by this time, have become so softened by decomposition as to impart their soluble matter to the water, which, of course, is now promptly cleaned, but which has already been a source of poisoning to the water for days and weeks before. They seem to be a general catch-all for "fish worms," which are soon drowned, and add their share in furnishing organic poisons to the common supply of well water.

I see many wells whose loose "nigger head" walls are slimy with filth below the "water line," and covered with moss from there to the surface, which in turn loosens and falls into the water, and adds to the supply of organic matter.

Many farmers are not content with digging a well where the surface water has easy access to it with every freshet, and to which is added the filth of ducks, geese, chickens, and house slops; but they will even dig them in their barn yards, in the very midst of decomposing manure, and fearlessly give it to their animals, and carelessly drink it themselves.

If you must have a spring or well, see to it that it is absolutely free from all these objections. Guard it as stringently from the introduction of "wild water" and organic matter in any form as you would your wheat granary from thieves, or your bed from bugs, or your butter from hairs.

If you prefer a well, locate it where no surface water can enter it under any circumstances, and see to it that no subterranean passage can carry poison to it from a water closet, hog pen, or barn yard.

Only a few years ago, I saw a whole family stricken down with diphtheria from this cause, and another with typhoid fever in the same way.

Wall your well up tight with hard brick and cement, as you wall a cistern, and close the top securely, so that nothing but pure water may enter it, which may be kept pure after it does enter, and free from ammonia, albumoids, nitrates, chlorides, or other objectionable intruders.

Do not flatter yourself that a well sunk in rock is secure, and free from organic matter. Beware! if there is a privy with a vault dipping down to the rock of the same vicinity. I have seen several instances of this kind where the contents of privy vaults had traversed hundreds of feet through crevices in the rock, and found their way to the bottom of wells fifty or sixty feet deep, imbedded in apparently solid rock.

I have no doubt where it can be used, the so-called "drive well" is among the safest and the best form of wells, and furnish the purest supply of this class of water. But better than any, and safer than all, is a properly constructed cistern. These should be placed on high ground, and sunk to a depth of 20 feet or more, and made large enough to hold at least one hundred or more barrels. They should be walled with a double row of brick, securely cemented so as to exclude all "wild water," and arched over about five feet from the surface, leaving a man-hole extending a couple of feet above the surface, which should be securely closed so as to positively guard against the introduction of any foreign substance of any kind. From the arch to the surface

they should be filled up with clay, which should be firmly packed and raised around the man-hole so as to drain all surface water away in every direction from the cistern.

A filter of charcoal mixed with sand and gravel, of at least a foot in thickness, should be placed in the cistern, and the water from the roof emptied on one side of this filter, and pumped out from the other side.

The cistern should be filled during the winter or early spring, while the rain is cool, and the air comparatively free from insects, dust, and organic matter; and before it is turned into the cistern, enough of rain should be allowed to fall to wash the roof as clean as possible. No water should be allowed to enter the cistern from early spring until late fall, after the leaves had fallen and been removed from the roof, and the cold rains of November have begun.

In this way you can obtain a bountiful supply of clean, pure, cool, healthy water, which can only be surpassed in purity by distillation; and especially so if the house you gather your supply from is covered with a slate roof. But the cistern must be absolutely water tight, or it is liable to the same objections as the well. Care should be taken to strain, through a coarse sponge or similar substances, all water that passes from the roof to the cistern.

By providing a water supply in this manner, we might avoid, annually, thousands of cases of sickness in our State from the use of impure water.

SCHOOL HOUSE.

Next to our dwellings and their surroundings, we should look to the construction and sanitary conditions of our school houses. It is a lamentable fact that too little attention is paid to this common dwelling in which the youth of our land must spend a large portion of the most important part of his life.

They are not only too frequently located without the least attention to their sanitary surroundings, but built without the least regard to hygiene as to their lighting, heating, and ventilation.

How many school houses are there in Richland county to day (and this may apply to any county throughout the State), out of every score, that has a dry, healthy location, and is supplied with first-class drinking water, has dry, clean walks to keep the scholars out of the mud and wet, and properly constructed water closets that are kept clean and in a sanitary condition, saying nothing of proper heating, lighting, and ventilation?

In fact, the large majority of school houses, and especially those in our rural districts, are without walks and an insufficient supply of pure drinking water; and so located that the moment the scholar passes the threshold of its door in bad weather, he must wade in mud ankle deep, and if he wants a drink of water, must go to some neighboring farm house through the mud for it.

How many of their water closets have ever been cleaned, saying nothing about regular cleansing and disinfecting?

Not the least attention is paid to the lighting of our costly structures that now adorn every district in our county. The poor scholar must sit with the gleaming light of huge windows shining in his eyes day in and day out, which, with improperly constructed and adjusted seats, prevents the eyes getting a moment's ease while the pupil is in the school room, and then their parents come to the physician or optician in amazement, wondering why their boy or girl has "weak eyes" or is "near sighted."

It has been shown by investigations, that in elementary schools 6.7 per cent. were myopic (near sighted); in the intermediate, 10.3 per cent.; high school, 19.7 per cent.; colleges, 26.2 per cent.; and in the highest classes,

or those who have been attending the longest, 55.8 per cent., more than one-half.

The fact that the percentage of school nearsightedness increases the longer the scholar is in school, is evidence that school-life has something to do with the increase of this disease, which must, in turn, be attributed to the improper protection of the eyes.

Few school houses have any provision for ventilation whatever, other than that provided by the open door or window, with all their evil consequences from direct drafts of out-door air.

A huge stove is set in the school room which, when heated sufficiently to make the room warm enough to be comfortable at the points most distant from the stove, is quite "too comfortable" for those who sit near it; and while those who sit near the windows are being supplied with too much cold air, those in the center of the room are bathed in an atmosphere of foul, hot air. And yet parents wonder why John and Mary have colds and suffer all the winter long with catarrh, and must be taking cough syrups from fall to spring. The cause is apparent, which, if removed, the effect will disappear as rapidly.

Light your school houses so that every scholar will have plenty of light without any light shining directly into his eyes. Construct your seats and arrange your scholars on them so that their books will be held a proper distance from the eyes, so as not to keep them constantly strained.

Heat your school houses so that every point is heated alike, and ventilate them so that every scholar gets five hundred cubic feet of fresh air, raised to the temperature of the room, which should be about 70° Fah., every hour; and you will find the sick calls lessened just in proportion to your observance of the laws of health and the execution of sanitary laws.

Now, ladies and gentlemen, you have borne with me patiently while I have tried to point out a few of the sanitary errors you, as farmers of this wealthy county, are still liable to fall into; not in the spirit of fault finding, but in the firm belief in the old adage, "a word to the wise is sufficient," and in order to convince you of the importance of my subject, I have simply called your attention to existing evils that are common all over our State, that you may the easier avoid them. In addition, I have given you a few outlines as to how to remedy these unsanitary conditions.

I said, in the beginning of my talk, that thirty-one States have State Boards of Health for the protection of the lives and health of their people; but I am sorry to say that Ohio has no such provision in her laws to-day, notwithstanding the sanitary workers of the State have been earnestly laboring to that end for years.

Already a bill has been introduced in both houses of the General Assembly to provide such legalized sanitary protection, which I trust will become a law before this present Legislature adjourns; not because I am the author of this bill; not because it is a sanitary necessity in the State of Ohio to-day, and is needed to protect you and your families from preventable sickness and premature death. I stand ready and willing to support the *best possible bill* for the purpose we can get, let it come from what source it may. Before I close let me beg of any farmer here to-day who has a grain of influence in our General Assembly to use it in favor of the passage of a bill for the organization of a State Board of Health, which is alike of interest to us all.

NOTE.—Since the reading of this paper, a modification of the original bill, as introduced by Senator Sinnett, has passed the Senate 28 to 1, and the House 78 to 12, and is now a law.

COUNTERFEITING AND ADULTERATION—TWIN CRIMES.

By W. I. CHAMBERLAIN, SECRETARY.

[Delivered at several Institutes.]

One can hardly fail to notice that our moral sense is far more clear in regard to the crime of counterfeiting money, than in regard to equal or twin crime of counterfeiting or adulterating food. We punish the first with State's prison; the second, not at all. I go to the grocers, for example, for coffee, spices, butter, cheese, or to the hotel for a dinner. If I knowingly pay in counterfeit money or debased coin, the law sends me to prison. But his coffee may be half chickory or peas, or burnt horse's liver, his butter two-thirds lard or tallow "neutral," his ground spices may have had half their essential oils extracted, his cheese may have had its milk skimmed on both sides so that it is scarcely digestible even by the tough stomach of a cannibal, and the grocer or hotel man may *know these facts*, and sell these sham goods for genuine, (at least in Ohio, now,) and the law lay no finger on him to punish his ungodly deeds. Why is this? Not because his goods are worth something, and my money, nothing; for alleged coin is worth *something*, and my one dollar of bad paper money in ten dollars of good may cheat him less than he cheats me in what he sells me for genuine. It is not the amount at stake. Indeed, the more stupendous the fraud the more surely is its crime unpunished. If your retail grocer *himself* sells you pure roasted Java by sample, and on grinding it mixes half chickory, you despise the meanness and deceit. He is giving you what you did not buy; short weight for full; mixed goods for pure. But a great New York firm adulterates hundreds of tons and sells it, through this, your same grocer, in packages marked "pure," and neither the wrath nor the contempt of the community is visited on either one of them.

Take another example. If the farmer skims even a pint of cream for coffee from the fifty gallons of milk he sells at the cheese-factory or creamery daily, or puts in even a little water or keeps back the richer strippings, our State laws prescribe heavy penalties, and the factory or creamery man is swift to enforce them. But the same factory man will skim every gallon of the milk he buys, make butter of the cream, sell the "white-oak" cheese, colored and mellowed to deceive eye and tooth and tongue, with no hint, at least to the final retail buyer, that it has been robbed of half its nutritive and real value, and the law does not touch him at all. Fraud on a large enough scale goes unpunished. It is idle to say that consumers know the cheese is skimmed, the butter three fourths lard or "oleo-neutral," and the pepper nine tenths gypsum, mustard husks and starch. They do not know it, as a rule, or else have no option. Nine tenths of the final consumers of butterine, think they are buying butter, and pay the price of butter, or within a cent or two a pound of it, as a member of the firm of P. Armour & Co. himself admitted to me. It is idle to say it is healthful. Sometimes it is, but sometimes not. The point, however, is that we do not get what we pay for. A counterfeit is "shoved off" upon us. We pay for the genuine, and get what it costs, and it is worth, perhaps, less than half as much. We are defrauded as truly as when we take counterfeit money for genuine. The wide margin of profit makes the counterfeiting of money lucrative while undiscovered. The wide margin of profit in adulteration does the same, and puts manufacturer, grocer and hotel man in closest league, and keeps the accursed business alive, making our legislatures and

courts blind and deaf, while the few grow rich by this petty theft from the many.

Now, why do we make outlaws of those that counterfeit our money, and that forge names to checks and notes of hand, and leave unpunished those that counterfeit our food? Are our pockets more sensitive than our stomachs? But adulteration is a crime against both pocket and stomach.

A brief glance at history may help to answer this puzzling question just asked. Counterfeiting (and hereafter I use the word in regard to money) seems to have begun earlier in history than adulteration, and I think the moral sense is better developed (perhaps I should say less perverted), because the great evils of counterfeiting have had more time to become manifest; for the moral sense is sometimes helped and quickened by enlightened self-interest. Just when counterfeiting crept in we cannot tell; but in 1108 A.D., it had become so common and so damaging that Henry I. prescribed heavy penalties. Henry II. found the coin so clipped, debased and reduced in value that he ordered a new coinage, and increased the penalty for debasing or counterfeiting. Henry III., in 1248, found the coin of the realm badly clipped and filed, and ordered all old but genuine coin to be exchanged at the mint for new, *by weight*. This brought the loss upon the then present holders of the coin, sometimes an injustice, but effectual, as we saw recently in this country when banks and business men in general refused to take punched coin except at heavy discount. In 1299, Edward I. decreed death for all who should import foreign coins of inferior value. Edward II. kept up the bitter fight, and Edward III. assumed inquisitorial powers, and required inn-keepers to search their guests for foreign coin, presumably debased.

In 1416, Parliament made it treason to counterfeit the coin of the realm. Under Edward VI., the currency was so depreciated and uncertain that the seller scarcely knew what value he was receiving for his goods. Note, that now the case is exactly reversed. Then the goods were genuine and the money counterfeit; now the money is genuine, and the goods are counterfeit. Counterfeiting of money is virtually stamped out; adulteration of food has come in.

By just what steps and struggles counterfeiting was thus suppressed, I must not stop to show. It is enough to say that the fight of the swindled many against the swindling few went on until the history of many centuries had demonstrated the evils arising from counterfeiting the coin, and had shown that a uniform class of coins of standard weight and purity is an absolute essential to business prosperity. Still more manifest did this appear when paper currency came in and the modern system of banks and banking, with checks, drafts, and clearing houses grew up. Under these it became clear that nothing short of the most stringent laws, most sternly enforced, and backed by the moral support of the whole people, could save our country from being flooded with counterfeits, and that such flooding would ruin all business prosperity. When the same conviction is forced upon us in regard to *adulteration*, we shall stamp it out as we have stamped out counterfeiting.

But our experience here has not yet been long and bitter enough, it would seem. Skill in adulteration has been of far more recent date, and its evils have been less vital and less manifest.

The methods of adulterating are of two general classes, viz.: the substitution of a weaker, cheaper, or even worthless ingredient for part or all of the genuine, and (2) the extraction from the original of some of its valuable constituents. Both reduce strength or quality, but not bulk or weight proportionately.

The degree and extent of adulteration have increased amazingly in this

country lately, chiefly for three reasons or causes: First, the increase and diffusion of scientific knowledge, especially in the two lines of chemistry and physics. Second, the increase in population, and hence in prices of land and the products of land, and in the profits of adulteration. Third, the sharper competitions of trade, and the absence of the restrictions from guilds and the like, and from governmental control so common in the old world. As a sample of ancient governmental control may be cited the famous statute called the "pillory and turnbul" (Henry III, 1250). This is the first on record, so far as I can learn, that especially noticed frauds in food, and even this seems to have been directed rather against short weights and measures used by bakers, butchers, spicers, grocers, and the like, than against adulteration, which had not then sprung up. The keenest, and most disgracing, and humiliating penalties were inflicted for this contemptible petty theft of short weights and measures.

But all this has disappeared, or never existed in this country. Each person seems free "to do what is right in his own eyes." In many of our cities there is no ordinance for sealing weights and measures. I have seen within a stone's throw of the Capitol in Columbus, a boy licensed by the Mayor to peddle, while selling peaches stop and deliberately whittle an inch from the top rim of his half peck measure! And when a passer-by stopped and said, "Look out, boy! or the police will go for you," he went on, whistling serenely as before, with only the polite remark, "Police be hanged!" Clearly where the moral sense is at so low an ebb as to permit false weights and measures to be used thus openly, in the law making city of the State, adulteration will go unpunished. Here the evolution of the moral sense seems to have gone backward sadly. Adulteration has gone unchecked, and has become an art in which science, inventive genius, skill in mechanism, and the push and enterprise of trade have free scope to work.

As misery likes company it may perhaps be a relief to know that in England, notwithstanding the stringent laws above referred to relating to short weights, yet in regard to adulteration the conscience, the laws and the practice fifty years ago were as they are here now. At about that date Mr. Accum, one of the most expert chemists of the day, published the results of careful investigation in his work on "*Culinary Poisons and The Adulteration of Food.*" This was the opening wedge. In 1851-2-3-4 a series of able articles in *The Lancet*, the great medical and surgical periodical of England, had the effect of securing a "Parliamentary inquiry," which was most thorough and resulted in the act of 1860. This act gave to local and municipal authorities *power* or *permission* to appoint chemists, and on their evidence inflict heavy fines for guilt. But the law was simply *permissive* not *mandatory*, and hence was of little value, just as our fertilizer law was until it was made mandatory, and actually appointed an inspector and made it his duty to act; and just as our "Bogus Butter Law" will be until it does the same thing.

Not until 1872, only fourteen years ago, was the English law of 1860 amended and made mandatory, and since then it has been truly effective. The fine is fifty pounds (\$250) for adulterating drugs with any thing at all, or foods with any thing injurious; and a second offense adds to the fine six months imprisonment at hard labor. Twenty pounds (\$100) is the fine for knowingly selling adulterated food. In other European countries the penalties are quite as severe. If we were to particularize through the entire list we should establish the remarkable fact that of all civilized Christian nations, the United States is now the only one in which adulteration of almost every kind and degree go almost absolutely unhindered and unpunished.

One reason, perhaps, for this is that we have been opposed on general prin

ciples to all unnecessary governmental interference with private business. And so we have suffered adulteration to grow up and ramify until it is hard to prevent, because so immensely profitable pecuniarily to those that practice it. But that seems no reason for protecting it, any more than the fact that counterfeiting is profitable protects that from the penalty due to one of the worst forms of dishonesty.

The financial damages of adulteration have at last come to be most serious. It injuriously affects, nay, threatens the very life of some of the most important of our agricultural interests, glucose striking at our sugar interests at the South and our maple sugar interests at the North, and butterine, oleomargarine, and lard cheese prostrating our dairy interests at the North.

I will not give a history of the rise and growth of these forms of counterfeiting or adulteration. They are too fresh in your minds, and the havoc they have wrought and are still working in our vast dairy interests is too manifest and too sickening to need enlarging upon in your presence. Nor have I followed the history of counterfeiting and adulteration through so many centuries from mere historic interest, but that we might be able to learn from it at least the direction from which the remedy must come; even a doctor makes a careful diagnosis of a disease and the past causes that induced it, and of the treatment found best elsewhere.

Under the head of remedies and treatment, I remark:

First. Our apathy must be broken. We do not feel this crime of adulteration *to be a crime*, until it strikes us and our interests, and then we wonder that the whole world does not see it too; and we cry out for special class legislation instead of a stern law against all adulteration, as the twin crime of counterfeiting. On this point and to this belief the whole community must be aroused. We must be made to feel that *stealing is stealing*, whether in the form of passing bogus money for genuine money, or bogus goods for genuine goods. That, like counterfeiting, adulteration is a crime from which the mass of the people suffer loss, while a few grow enormously rich. Buyers should be thoroughly convinced that they cheat only themselves by using any adulterated product whatever. Then they will require the genuine of the retailer, and the latter in turn will require the genuine from the manufacturer or wholesale dealer. Boarders and traveling men should insist that so long as they pay full price for board, they shall have set before them the pure butter, cheese, tea, coffee, spices, and the like, for which they pay. All farmers and all buyers should settle it in their minds that manufactures do not adulterate from benevolent motives. They do it to make money, and a good deal of money, out of us the producers of the genuine, or you the consumers of the bogus, or out of both of us. That the profits are due to the deceit practiced, and that they are enormous, may be seen from the admission of a member of the firm of D. Armour & Co., that probably nine tenths of their enormous product of butterine and oleomargarine is sold by the retailers *for genuine butter*, and at just about the price of genuine butter; that they, the manufacturers, will aid the retailer in his deceit by putting up in regular butter packages and branding them, for example, "Willowdale Creamery," "Glenville Creamery," etc., with no possible hint that the contents are any thing but genuine butter. As to profits he said their firm sold the best then (November 13, 1885) at about eleven to fifteen cents, and that probably the most of it sold as genuine creamery butter at about twenty-four to twenty-five cents per pound.

Second. From the above it is plain that in the conflict that is already upon us for law and the enforcement of law, on the one side will be arrayed the rich manufacturers with their enormous profits, the retailers with their enormous margins, and the keepers of hotels, restaurants, and boarding-houses with their

considerable savings in the cost of supplies. On the other side *should be* as firmly united the producers of pure goods, and all who desire to use pure goods or get, in buying, what they pay for. The latter two classes are far the most numerous; the former three classes are far the most united and persistent. But if we too are united and persistent we can drive adulterated and counterfeit goods out of market, both by the lack of purchasers, and by the enactment and enforcement of wise laws.

Third. We should not seek class legislation as such. We should not place the main emphasis on the fact that an important part of our agricultural interests is in danger, though this is true. The facts we should emphasize are these; that bogus goods are now sold *for genuine goods*, and at the price of the genuine; that those who make such goods with such intent *are counterfeiters*, and those that sell them thus are "shovers" of "the queer;" that they are *defrauding* their customers, obtaining money under *false pretenses*, taking value for which they do not give a *fair equivalent* of value; and that this is against the public health and wealth and morals, and should be punished as severely as the counterfeiting of money.

Thus our warfare and our legislation should, I think, be against the *deceit* and fraud practiced. I do not think we can successfully oppose the sale of any healthful substitute for an article of food, or any useful substitute for any article of merchandise, provided it be sold wholly and only *for what it really is*. In such an attempt, I think, we must fail. The scientific records of three centuries are full of the history of *substitutes* that have wholly or nearly supplanted the original article in use, but only after a bitter fight. For example, in 1548 indigo was unknown in Europe. When it and cochineal, logwood, anotto, quercitron, Brazil wood and other dyes were introduced into Europe from Central and South America, they met with the most bitter opposition, especially indigo and logwood. The cultivators of the "woad," then in general use for dyeing blue, caused decrees to be issued against indigo as a most dangerous product. The German Diet, in 1577, declared it to be "a pernicious, deceitful, eating and corrosive dye." It was named "food for the devil." An act of Parliament in Elizabeth's reign forbade the use, and authorized the destruction both of indigo and logwood wherever found. But the world needed indigo, and logwood, and cochineal, and the rest, and in spite of class legislation they came into general use. Not, however, as *counterfeits* of something else, but in their real characters, and under their true names. After nearly three centuries the aniline, mineral and coal tar dyes were discovered or invented, and in the midst of bitter opposition, and with heavy loss to existing industries in indigo and the other older dyes, virtually supplanted them. Not, however, by *pretending to be* indigo or logwood, but by proving to be cheaper and sufficiently good. Thus has coal supplanted wood; gas and petroleum have driven out whale and lard oil and candles; and natural gas or artificial gas made in the great coal fields, and carried in pipes to the cities and manufacturing centers, seems likely soon to supplant coal itself at those centers as a source of heat and motive power, with great saving of actual energy.

These changes of material, use and mode of application come always with heavy individual loss, often with calamity and even ruin to existing industries, but with substantial gain to the world. Without them progress would be impossible. This earth is rich in its marvellous resources, and its inhabitants need them all. If a vegetable substance can take the place of the costlier animal substance, or in turn, if the mineral or inorganic can fill the place of the more expensive vegetable substance, then the world needs them. The change is a substantial gain.

So, if the products made and sold by Armour & Co., and his kith and kin,

are better than butter, and as cheap, or cheaper than butter, and as good and healthful, neither of which has been shown,—but if this is true then the world needs these products, and will have them. But they should be sold for just what they are. We should insist that the facts be known, viz.: that “manufacturers” in Chicago and other cities are now buying one-quarter or less of pure butter, mixing three-quarters or more of cheap lard or tallow “neutral,” sometimes even from diseased or smothered animals, and selling it *to the final consumer as pure butter*. We should insist that this is counterfeiting or alloying, and should be stopped or severely punished.

Fourth. As farmers, we should insist that no form or degree of counterfeiting be found in our own midst. I think, this is already substantially true of farmers themselves. But the owners of cheese factories in this State have, it seems to me, made an amazing mistake in trying to make both butter and cheese out of the same milk. To be the delicious, nourishing and healthful food it should be, cheese must contain all the cream that nature gave the milk. It is as truly adulteration to take from any substance a part of its most valuable ingredients, and make no return, leaving nearly full bulk and weight with greatly inferior strength, flavor and value, as it is to add inferior and worthless matter to increase bulk and weight, but not value in the same ratio. The one adulterates by subtraction; the other by addition. *Both adulterate*. What right has the country factory man to adulterate his cheese by subtraction, and then objects if the city factory man adulterates his butter by addition. My candid opinion is that “skim-milk” cheese has hurt the dairy interests of Ohio as much as bogus butter. And, I think, the Ford law of last winter was seriously defective in excepting “skim-milk” cheese from its prohibitions and penalties. The camp of Israel could not prosper while Achan had the wedge of gold hidden within his tent.

Fifth. We should know and never forget the fact that the United States is now the only civilized and Christian nation that has absolutely no conscience about and no real protection against adulteration. All nations, including ours punish counterfeiting money, and make counterfeiters outlaws. All civilized nations but ours punish adulteration. This should fill us with burning shame and yet with hope. For since they have virtually stamped out adulteration we can do the same.

I have spoken mainly of adulteration of dairy products, because the financial evils here are most alarming. But adulteration exists in almost everything we eat, drink, wear or take as medicine. A general law all along the line is needed, though doubtless a bogus butter law must be the entering wedge.

Sixth. We have a right to the protection of law. The law always stands between, or rather over buyer and seller. It enforces contracts and punishes fraud. It makes the buyer pay honest money. It should make the seller deliver honest goods, exactly what is paid for both in quantity and quality. It already punishes the sale of plated or veneered goods for solid, and only the lowest characters are guilty of this dishonesty.

The same should be true, but is not, in regard to adulterated foods. The same law that compels the buyer to pay full dollars of genuine money, should compel the seller to deliver full gallons or pounds of the genuine article paid for. If the eye, the sealed measure, or the scales, can assure the buyer of this, then that is all that is necessary. But in the case of adulterated goods, or of compound goods, like commercial fertilizers, for example, the eye and the ordinary measures and scales, cannot assure the buyer. A chemical analysis or a microscopical examination is often necessary to find and weigh the valuable ingredients hidden from the unaided senses. These analyses and examinations are expensive and difficult. The individual buyer cannot perform them, nor

ought he to pay for them. Hence this work must evidently be done, if at all, by special officers or commissioners under authority of the State.

In conclusion, it all reduces down to two self evident principles. *First*, the buyer has the right to be assured that he *gets what he pays for*, the exact substance and nothing else, the exact amount and no less. *Second*, the State or the nation is bound to protect him in this right; and the more difficult it is to get the weight or the analysis, the greater is the temptation to fraud, and the probability of practicing it with impunity, and therefore the greater is the need of governmental intervention. These truths are so fundamental as to seem rudimentary, and their statement and explanation almost childish. And yet this whole nation is walking blindly over them, nay, trampling them in the dust, not in the least regardful of their truth or their importance. Organized effort alone will secure the necessary laws, and enforce them, backed by enlightened public sentiment.

NOTE.—Since this lecture was written, and delivered in some forty counties of Ohio, similar agitation has been widespread, and stringent laws have been passed by many State Legislatures, and finally by the National Congress. To-day, as I finish revising this MS. for the Ohio Agricultural Report, the daily papers bring President Cleveland's message to Congress, showing why he signed, and did not veto, the "Butter Bill," as it was expected by many he would do. From that message I clip three sentences in striking harmony with the above lecture: "Notwithstanding the immense quantity of the article described in this bill, which is sold to the people for their consumption as food, and notwithstanding the claim made that its manufacture supplies a cheap substitute for butter, I venture to say that hardly a pound ever entered a poor man's house under its real name and its true character." And again: "If the article has the merit which its friends claim for it, and if the people of the land, with full knowledge of its real character, desire to purchase and use it, the taxes enacted by this bill will permit a fair profit to both manufacturer and dealer. If the existence of the commodity taxed and the profits of its manufacture and sale depend upon disposing of it to the people for something else which it deceitfully imitates, the entire enterprise is a fraud and not an industry, and if it cannot endure the exhibition of its real character, which will be effected by the inspection, supervision and stamping which this bill directs, the sooner it is destroyed the better, in the interest of fair dealing."

AMES, IOWA, August 3, 1886.

W. I. CHAMBERLAIN.

HOW NEW VARIETIES OF FRUIT ARE ORIGINATED.

BY GEO. W. CAMPBELL, SECRETARY STATE HORTICULTURAL SOCIETY.

[Read at the Painesville Institute.]

There are three ways in which new or improved varieties of fruits are produced. The oldest, and the one by which the first improvements of our fruits were slowly made, through long series of years, was by natural, or chance seedlings, from the original or wild types, after being domesticated or brought under artificial culture by the hand of man. We are told that all our beautiful and luscious fruits, so pleasing to the eye, so tempting to the palate, and so necessary to the health and comfort of refined and civilized humanity, have

had their origin in the sour and bitter crab apple, the wild and thorny pear, the various sour and acrid plums and cherries, the dry and flavorless peach, and the brambles, vines, and bushes of the forests. The long list of juicy and refreshing grapes which delight our vineyardists, and make glad the heart of man, have sprung from their sour and seedy and foxy ancestors, types of which are still found in our forests. In their wild and uncultivated state, the energies of fruit-bearing trees seem to be diverted only to their re-production, through vigorous growth and perfect seeds; and it was only after they were brought under cultivation, and seeds from cultivated trees and vines were planted, that marked amelioration and improvement in the edible portion of fruits began. No very marked change or improvement can be made in any *individual* tree or plant, by cultivation. It may be increased in size, and perhaps slightly ameliorated in flavor and character; and though it may be perpetuated by cuttings or grafts, its individual character always remains. But if *seedlings* are grown from a tree while it is young and vigorous, and in a state of progressive development, the chances are that among these seedlings there will be changes and improvements. Selections of seeds from the best of these, again planted, may result in further improvement, and after successive generations have been grown in this way, great excellence, and many new varieties may be produced. The most extensive experimenter in this direction, of whom we have any record, was Dr. Van Mons, of Belgium, who devoted the greater part of his life to this pursuit. He raised many thousands of seedling fruits, some of them of much value; and this way of raising new varieties by planting the seeds four successive generations of trees, has been called the *Van Mons' Theory or Method*. He found that in each successive generation the seedlings came earlier into bearing, and produced more good varieties; until in the fifth generation, nearly *all* were valuable. He thus describes and emphasizes his practice. He says: "I have found this art to consist in regenerating in a direct line of descent, and as rapidly as possible an improving variety, taking care that there be no interval between the generations. To sow, to re-sow, to sow again, to sow perpetually, in short, to *do nothing but sow*, is the practice to be pursued, and which cannot be departed from; and, in short, this is the *whole secret* of the *art* I have employed."

There is no doubt that important and valuable results have been produced, and *can still* be produced by this method, by any one who has a taste in that direction, and is willing to devote a life time to its pursuit; but as in many other things, in later years, I think we have discovered a quicker and a better way.

The second method, which I will briefly mention, is one that, so far as I know, is not under the control of man, and whose laws are not yet well understood. It is what is called "sporting," or bud variations, and seems to arise from some inherent tendency in trees, plants, or vegetables, under high or artificial cultivation, to vary from their normal type. This may be illustrated by the Late Duke cherry, which is said to have originated from a branch of the May Duke which did not ripen its fruit till that upon the other portions of the tree was long past. Trees propagated from this branch produced a permanent late variety. Many flowering plants, roses, and others, show this tendency, and propagating from "sporting" branches often gives new and sometimes improved varieties. In vegetables, the Late Rose potato, and some other varieties, are claimed to be "sports." In my own observation, I now recollect that some years ago, in one of my green-houses, a pure white moss rose grew upon a branch thrown out from a red variety. All other portions bore dark-red roses; and there was no appearance of grafting or budding, the branch bearing the white rose coming from a side-bud on the main stem. I presume

plants propagated from this "sport" would have continued to bear white moss roses; but as the flower possessed no special merit above other white varieties, it was not propagated, though it would have been interesting as an experiment. But there are now in cultivation a good many new and fine roses which have originated in just this way, and which seem to have a fixed character, and retain their new type in propagation.

But the third, and most important of all, and the one most under the control of man, and the one, too, which is the most certain to produce speedy and measurably certain results, is artificial cross breeding, or, as it is often called, hybridizing. This art is comparatively a recent discovery, but is now more extensively practiced in producing new varieties of fruits, flowers and vegetables, than any or all others. It is a little remarkable that Lord Bacon, who seems to have had the idea, and to have foreshadowed it in his writings, did not himself discover it, or induce others to do so. More than a hundred years ago he wrote thus: "The compounding or mixture of plants is not found out, which, if it were, is more at command than that of living creatures; wherefore it were one of the most notable discoveries touching plants to find it out, for so you may have great varieties of fruits and flowers yet unknown."

This process consists, simply, in removing the stamens of the flowers to be operated upon, before the fertilizing dust, called pollen, has formed, and then protecting the stigma or pistil from being fertilized by surrounding blossoms from the same or other trees or plants, until you have dusted it with pollen from the variety with which the cross is to be made. When this has been done, the covering should be retained until the fruit-germ begins to grow and increase in size, showing that the fertilizing process has been successful. Seeds from the fruit thus crossed will be almost certain to produce varieties intermediate, or possessing some of the characteristics of both parents or varieties.

It is evident that the first method of improvement by successive generations of seedlings must precede, to a certain extent, the more rapid and certain method by cross breeding; but with the number of excellent fruits which we now have, it would seem that by an intelligent and persistent combination of these excellencies through successive generations, of cross-bred varieties, we may reach a point of improvement as near to absolute perfection as mortals are allowed to have this side of Paradise. Any nearly allied species of fruits, flowers, or vegetables may be crossed in this way, and it depends upon the intelligence with which the crosses are made, to a large degree, whether they are beneficial or otherwise. It is well known that melons lose their power of reproducing themselves in good quality from seed if they have been planted too near to squashes or gourds or similar vines. It is claimed also, that seeds from old fruit trees, which are past their prime, usually go backward, and produce trees bearing fruit of the original, or wild form;—so when improvement is sought, young and vigorous trees, vines, or plants in a state of progressive development should be always chosen.

I have above attempted to describe particularly the method in which this cross-breeding or hybridizing of plants is performed, in the hope of interesting, particularly the younger people, and inducing them to continue and carry on these experiments and to originate more perfect fruits than any we now have, after the gray heads who are now experimenting have passed beyond the shores of Time.

It will thus be seen, that we can bring together and unite in this way the good qualities we desire in any two fruits, and produce new sorts of greater excellence, or perhaps increase the hardiness, or the earliness, or the size, or the productiveness, of some favorite variety which may be lacking in some of these

respects. My own attention has been for many years directed towards the improvement of the grape; and I have made a great many experiments, and produced very interesting, and perhaps important results. I still believe we shall have varieties of grapes equal to the best in the old world, having the health, and the hardness of our purely native varieties. Some of the grapes known as Rogers' Hybrids, though grown from the seed of a fox grape so sour and acrid as to be absolutely uneatable, and of an odor so strong as to be positively offensive—are so ameliorated by the first crossing with the fine foreign varieties, as to be mild and pleasant in flavor, and entirely free from any foxy odor. Nearly all these Hybrids are as healthy, as vigorous, and as productive as many purely native sorts. Still, they are not perfect; but such varieties as Massasoit, Lindley, Agawam, Wilder, Barry, Herbert, Salem and others are grown successfully, and are valued in many places. There has been no difficulty in my experiments in producing grapes of great beauty and of exquisite flavor by crossing our native, hardy varieties with the finer foreign kinds; but up to this time, I have not succeeded in retaining, with this fine quality and flavor, the full hardness of our most hardy natives,—and the finest quality, unfortunately, is too often associated with some tenderness of foliage and disposition to mildew in unfavorable seasons. I labor under the disadvantage of having, perhaps the most trying climate in Ohio, for grape-growing, when the thermometer goes to 32° below zero in winter, and to nearly 100° above in summer, and subject in all seasons to sharp and sudden changes; and I have probably thrown away hundreds upon hundreds of really valuable varieties, or those which would have been so in a more genial climate, because they could not endure uninjured the vigorous tests to which they were subjected. I say this, because upon testing many of the new and highly extolled varieties produced by others, I have found them inferior in nearly all respects to many of my own, which I have rejected. Still I am trying,—raising new seedlings, and making new crosses every year, and shall probably so continue, as long as I have health and strength, as the pursuit is both alluring and interesting. And I believe I have now in my little trial vineyard, varieties of my own production that would re-stock and supply the world with grapes of sufficient variety and excellence to meet the necessities of all regions where grapes can be grown, if every other grape on earth were destroyed. Some of you can, no doubt, remember when there were not more than three or four varieties of grapes in cultivation in this country—the Catawba, the Isabella, and the Clinton. We now have many hundreds, and every year adds to their number. Crossing with purely native kinds has not, so far, proven entirely satisfactory. I have tried to cross the Delaware and Concord, hoping to get the quality of the Delaware upon a vine with Concord growth and foliage. Twice, I thought I had succeeded, but in both cases, although hardness, foliage, productiveness, quality, all were satisfactory, the berries would fall from the clusters fully ripe, with the lightest handling. I have now such a variety, that, except for this one fault, I should regard as of the greatest value, as it endured uninjured 32° degrees below zero last winter in full exposure, and has shown neither mildew of the foliage, nor rot in the berries. This is one of the disappointments. But the originators of new fruits are not always without compensation other than the pleasure arising from their success. Mr. J. H. Ricketts, of Newburgh, N. Y., must have received more than \$10,000 for the proprietorship of new grapes which he has sold to different parties. The highest price doubtless, which was ever paid for one variety in the world, being \$4,000 received by him for the Empire State. This grape is probably the most valuable variety yet introduced, which has been produced by cross-breeding, as it appears to be vigorous in growth, healthy in foliage,

hardy in winter, and bearing fruit of great beauty and excellence. From the high character of this grape, I am quite sure there is some of the finer foreign elements in its composition, though it is claimed to be a cross between Hartford and Clinton. In growth and foliage, it has characteristics of both these varieties, but the grape has a decided flavor of the foreign Muscat; the finest of all exotic kinds. It seems to succeed well in all localities, so far as tested; to resist mildew and rot, and to endure the coldest winters. From my experience with it, I should plant it, feeling fully as confident of success as I should with the Concord.

It is natural enough that any one who has for a long time been engaged in a pursuit like this should observe many things not known or observed by others who have not made studies or experiments in a similar direction. By constantly observing the habits and peculiarities of seedling grape-vines, I am able to determine many things in regard to the character and quality of the fruit a vine will bear years before it comes into bearing. By the foliage, I can often tell what the color of the grape will be, and whether it is of native or mixed parentage. By another test I can tell with almost certainty whether a seedling will bear grapes with harsh, coarse, foxy or wild flavor, or delicate and refined, like the Delaware, Brighton, Dutchess, or other pure flavored kinds, and in hybrids, or varieties produced by crossing native and foreign kinds, whether the native or foreign flavor will predominate, and especially if the variety will have the peculiar flavor of the Muscat grapes, which, to my taste, is the most delightful of all others. Those who have eaten perfectly ripened fruit of the Muscat, of Alexandria, will know what I mean. To illustrate this, I will mention three, among hundreds of seedlings, whose character I determined in this way long before they were old enough to bear fruits. The first I stated positively would bear a black grape, that its quality would be fine, and that the fruit would have a Muscat flavor. The second would have a red or white grape, also of fine quality, but without the Muscat flavor. The third, a beautiful and healthy vine, a strong grower, with large and handsome foliage, and very large and prominent buds, resembling those of the foreign varieties, was, in appearance, one of the most promising seedlings in my garden. But upon testing it as to the quality of the fruit it should bear, I was surprised to find that the indications were that it would be of a wild, coarse, and worthless character. This was so much at variance with the appearance of the vine that I must say I doubted the correctness of the indications, and waited with some impatience, I think for two years after, when it bore a few clusters of small, seedy, black grapes, sour and wild, of the poorest character. The first-named bore black grapes, as I had predicted, of fine quality, and the Muscat flavor. The second, a red grape, much like the Delaware, but with larger berries and clusters. But both these varieties, with hundreds of others, I discarded years ago, because they would not stand the Delaware climate uninjured.

You would, perhaps, like to know how I determine the character of grapes before they have borne fruit. First, as to the color. This is not so easy; but by constantly observing the foliage of vines, a close observer can usually see a difference corresponding, in some degree, with the color of the fruit. But if, in autumn, the decaying foliage shows any tints of red color, you may be certain the vine will bear black grapes, and generally with red-colored juice. If the fading leaves show only yellow tints, the vine will generally, but not always, bear either white or red skinned grapes. Now, as to the quality of the fruit, we have an unerring test in the green tendrils of the vine. You know, a tendril is only an abortive cluster, and the flavor of these green tendrils is quite as varied as that of the grapes they bear. It requires some practice to discriminate and judge accurately; but I believe any man whose

taste is not blunted or depraved with tobacco or whisky, can learn it with a little practice and observation. In the growing season, let him taste and compare the flavor of the tendrils of the Delaware, the Concord, the wild grapes of our forests, and any of the more pronounced fox-grapes, and if he has access to a foreign graperly, also taste the grape tendrils of the varieties having the Muscat flavor and those which have not—and the characteristic differences in flavor of which I have spoken will be very apparent—and the grower of seedling grapes can, by this means learn to predict what will be the character of the fruit long in advance of their bearing.

But it is not with grapes only that profit may be expected by the originating of new varieties. Any new fruit or flower of remarkable excellence, beyond that of others, will command a large price. The crossing of the different families of roses has produced some remarkable results. Bennett's hybrid roses have commanded very high figures. The exclusive right to propagate and introduce the Wm. Francis Bennett rose in this country, was sold to an eastern florist for several thousand dollars, understood to be \$5,000. A western strawberry grower has produced a variety for which he is offered \$2,000.

I have, perhaps, pursued this subject as far as may be interesting or profitable, and I hope I may have succeeded in so far interesting some of you that you will take up and continue the pursuit, and produce improved fruits and flowers and vegetables that will continue to bless and add to the happiness and welfare of mankind, and cause your memory and your names to be held in grateful remembrance as benefactors of mankind.

THE ORCHARD—PLANTING AND CARE.

BY W. W. FARNSWORTH.

[Delivered at the Wood County Institute.]

The first and most essential requisite for an orchard is the proper soil. While we cannot always have just such soil as we desire, we should be careful to select the very best within our reach, and then fit it in the best possible manner. There is a variety of soils on which orchards may be successfully grown, and some on which they cannot be raised with any degree of success. A soil with quicksand any where near the surface is utterly unfit for an orchard, unless possibly a peach orchard.

The trees thrive finely for a few years if the soil is sufficiently fertile, but as soon as they begin to reach into the cold, sour, in fertile quicksand, a change is apparent, and the orchard soon decays. Where orchards are already planted on such soils they may be benefited by mulching and surface manuring and no plowing, thus keeping the roots near the surface, the mulch protecting them from freezing in winter and drying out in summer.

A fruit grower in our county planted an apple orchard of about one hundred trees on sandy soil, with quicksand subsoil, and about half a dozen trees on the clay banks of a creek about eighty rods from the orchard. The orchard has been planted about twenty years, and has never yielded half a crop; many of the trees are dead, and the remainder are nearly all diseased, while the half dozen on the clay are healthy and vigorous, and bearing more and better

fruit than the entire orchard. Yet this same soil raises fine crops of potatoes, strawberries, and raspberries (especially red ones), as well as general farm crops. Another unfavorable soil is mucky ground, or loose, black loam. Having had but little experience with it, however, I cannot speak positively. I would not plant on such soil had I any other accessible. If it were that or nothing, however, I would try the effects of lime to decompose the excess of vegetable matter in the soil, and mulching to prevent its drying out in summer, not neglecting to drain thoroughly, for it is a serious mistake to suppose that lack of drainage will render such land moist in time of drouth. Probably the most desirable soil would be a clayey loam, with clay subsoil. The ones to be avoided are those having a subsoil of quicksand or hard pan, and those of a loose open nature that incline to dry out badly. A few years ago the invariable advice given by horticultural papers was, "Select the highest and driest ground for the orchard;" but for the last few years the agricultural and horticultural journals of Illinois and other prairie countries have teemed with declarations that the only successful orchards were those on the low grounds, and that those on higher elevations were dead or dying. While this is, no doubt, partly true, it is calculated to mislead one not familiar with the circumstances. The high ground spoken of by the writers in these Western papers were often high bluffs composed of hard, thin, and sometimes rocky soil, while the low ground of which they speak is the deep moist, lying lower, but not wet prairie. But in this portion of the country a little observation will convince any one that it is only on land well drained, either naturally or artificially, that we can hope to succeed with orchard culture. Having selected the soil, next in order, if not already done, will be drainage. In the great majority of cases this is absolutely essential to success. It will possibly pay to drain deeper for an orchard than for ordinary field crops. My own orchards are drained with tile, laid from three to four feet deep, which is as deep as the outlet would permit, and probably is as deep as is advisable usually. I would put a drain between every other row of trees, which would make them from four to five rods apart.

The old saying that "whatever is worth doing at all is worth doing well," applies with special force to the orchard, and especially to preparing the soil before planting. Remember that you are now fitting the soil for a crop that is to occupy the ground for a lifetime, and act accordingly. If we commit a sin of omission or commission in preparing for a crop of corn or potatoes or other annual crops, we have an opportunity the next season to show forth our repentance by our works, and do better. But neglect in preparing the soil for an orchard is one of the unpardonable horticultural sins, which can never be fully atoned for, as after the trees are planted, cultivation is necessarily more imperfect and incomplete than before. In a tenacious clay soil subsoiling would undoubtedly be highly beneficial to make it more mellow and retentive of *moisture, not water*. The amount of preparation necessary depends very much on the nature of the soil. A clover sod plowed under is a good preparation, or better yet, plow under the sod (manuring if necessary), and plant to some cultivated crop, such as potatoes, corn, etc., for one year, and then plant. Soil that is strong enough to grow a good crop of wheat or corn is strong enough to grow a good orchard. The soil should be put in fine mellow condition by deep and thorough plowing, harrowing and rolling, or planting if necessary. I like the Acme harrow and flank drag very much for this purpose. Having fitted the ground, we are ready to select the trees. If farmer Jones found that he needed another horse to help about the next season's work, think you he would order the first horse jockey that happened along to bring him a horse four years old, from fourteen to sixteen hands high, war-

ranted true to name, and allow the jockey to substitute a mule, or an ox in case he ran short of horses in filling his orders, and agree to pay one hundred and fifty dollars for the same on delivery? And yet this is much the way some farmers buy their trees. Any one who wants to plant any quantity of stock, will find it much to his advantage to go to the nearest reliable nursery, inspect the stock personally, and contract therefor with reliable parties. Where this is not practicable, either send the order direct to the nursery, or give it to some honest tree agent with whom you are acquainted.

Peaches should be one year old from bud; pear and cherry, two; and apple, three to four. Pears are generally sold when three to four years old, but will usually do much better if planted when only two or three years old, as the older trees of pears in particular are usually very deficient in fibrous roots. Select neither the largest nor the smallest tree in the row. Avoid extremes. Select a good, healthy, medium sized, well balanced tree. Avoid those having forks in the top, as they are liable to split down with the weight of the fruit, and sometimes ruin the entire tree. Do not allow the knots to become dry while out of the ground, if it is possible to prevent it. The ground having been thoroughly prepared, take a team and plow and strike straight furrows where you wish the rows, returning in each furrow to clean and widen it. The cross marks can be made by dragging a chain crosswise of the furrows, or they may be set by stakes. Before planting trim off all bruised and broken roots with a smooth cut. They will heal much quicker. It requires two persons to plant trees to advantage—one to hold the tree in place, the other to fill in the soil. The ground having been fitted as described, it is not necessary to dig the hole much larger than the roots. The practice of digging a large hole where the tree is to stand is a poor one. On soils with a loose, porous subsoil it is unnecessary, and in tenacious subsoils it is an injury, as it forms a cistern to hold the water about the roots of the tree and damage it. Straighten the roots carefully, and work fine, mellow earth among them by hand, taking care that the earth comes in close contact with every rootlet and fiber. When the roots are all well covered tramp the earth thoroughly with the feet. This is very essential to prevent the air from penetrating through the loose earth too readily and drying it and the roots, and also to hold the trees firmly in place. If the ground is very dry, or it is late in the season, water thoroughly, immediately after the first tramping. When the hole is half or two thirds full put in enough water to soak the loose earth and roots thoroughly. Let it settle away and finish filling the hole. I seldom find it necessary to water, however. If the orchard can be planted to some cultivated crop, mulching will not be necessary; but if for any reason it cannot be cultivated, a mulch will be of great advantage. Coarse manure, rotten stalks, or straw will answer. I usually throw a shovelful of loose earth around the tree after planting, which, in a measure, leaves a mulch.

In planting, lean the tree toward the southwest. The wind will, in a few years, straighten the tree up, whereas, if set straight at first, they will soon lean to the northeast, and the sun, striking squarely upon the unprotected trunk, injures it, and invites, if, indeed, it does not cause disease and an early death. The trunk is better to be protected from the sun, either by heading the trees low whenever it is possible (especially in the case of pears), or by means of wide stakes, etc.

The difference in the temperature indicated by two thermometers on a clear, cold day in January or February, one on the south side of the trunk of a tree and the other on the opposite or shady side of the trunk, is so great as to make us wonder, not that so many trees are winter-killed, but rather that any escape. This condition undoubtedly is one of the causes of injury to the trunks where

the bark separates from the trunk, from the effects of freezing and thawing. The trees can sometimes be saved by nailing the bark on in place if discovered in season. I think, in addition to this, if I had any affected in that manner, I would build a small box around the tree, reaching a foot or so above the injured portion, and fill this with mellow earth, as soon as possible after the injury was discovered, first nailing the bark in place. Probably the best preventions of this injury are shading the tree, thorough drainage, and avoiding anything that would produce a late succulent growth and interfere with the proper maturing of the wood. A tree that goes into winter-quarters in a sound, healthy, well ripened condition, will stand intensely cold weather without injury, especially if there are no sudden changes. The damage to trees can not be measured by the distance below zero recorded by the thermometer. The cold weather of November, 1880, probably killed and injured more trees in this section than any other month within our recollection, and yet the thermometer, at its lowest, only stood about at zero; but the trees were not yet matured ready for winter.

As regards pruning at the time of transplanting, a good general rule is to cut the top off as much as the roots were cut off in digging, thus preserving, as nearly as may be, the natural balance. Should the roots be dry, cut back the top rather more. In pruning at this time, I generally cut out first all unnecessary branches. I next cut back those which have grown larger than the rest. This will generally be all the pruning necessary; and if so, I prefer not to cut back the remaining limbs, as the fewer scars on a tree the better. Unless the trees are quite large, no staking will be necessary, unless it is a broad stake or board on the southwest side to shelter it from the sun. Nor will it often be found necessary to water trees after planting. Should it become necessary to do so, remove the earth from around the tree, forming a basin nearly down to the roots; into this pour water enough to soak the roots thoroughly, and when it settles away, replace the earth. The distance apart to plant depends on circumstances; some require more room than others. The usual plan is to plant them in squares about two rods apart each way. My first orchard I planted eighteen feet by forty feet, with the intention of ultimately removing every alternate tree. This gives a land forty feet wide to plow, and is convenient in growing farm crops or small fruits. I have raspberries in mine. In my last orchard, I adopted the plan of many western orchardists and set my trees eighteen feet apart both ways; each tree will bear just as well for a number of years as if only one fourth as many were on the same amount of ground, and when they begin to crowd, they can be thinned. More than this, I believe they will do much better when young, by being, to some extent, a shelter and protection to each other.

The question of varieties is one that is deservedly receiving much attention of late. The unusually unfavorable winters of the past few years have taught that many varieties which are otherwise desirable are not hardy and can not be relied on; and, more than this, that oftentimes varieties which are hardy in one locality are tender in places within a hundred miles from there. Considerable attention has been directed to the Russian varieties of apples of late, and, no doubt, many of them are valuable, especially in the extreme north; but, as a class, they cannot compare in quality with our own varieties, and but few of them are desirable where our American varieties can be successfully grown. The planter should be governed in his selection of varieties by the purpose for which he is planting the orchard. If for market, but few varieties are desirable. If near a good market, Red Astrachan, Summer Queen and Maiden's Blush may prove profitable; but the majority of apple growers will not care to grow many early apples for market, especially if, as is the case with most

apple-growers, they carry on a general farming business. Of the winter varieties, Baldwin, Ben Davis, Spy, Rhode Island Greening, and Grimes' Golden are among the best. Rhode Island Greening does not succeed well on all soils, however. Ben Davis is a hardy tree, a great bearer of red fruit of fair quality and a long keeper. Grimes' Golden will probably prove profitable in supplying the general demand for good fruit, as it is of fine quality and a healthy, hardy, productive tree. Smith's Cider does finely in some parts of the State, but does not succeed well in the northwest. The cold November of 1880 nearly exterminated them in our neighborhood, near Toledo, Ohio. Shippers prefer red apples. The Tulpehocken, which was formerly quite a popular market variety, is losing favor, on account of the poor quality of the fruit, as it is neither good to cook nor to eat, and also on account of the short life of the tree. In planting for home use, a much larger list is desirable, in order to cover the entire season; to have apples to cook and apples to eat and gratify the peculiar likes of various members of the family.

The following named in about the order of their ripening are mostly of good quality, and generally succeed well in the northern portion of the State, viz.: Early Harvest, Red Astrachan, Summer Queen, Sweet Bough, Williams' Favorite, Lowell, Porter, Chenango, Ohio Nonpareil, Fameuse, Fall Wine, Maiden's Blush, Twenty Ounce, Rambo, Belmont, Grimes' Golden, R. I. Greening, Spy, Baldwin, Red Canada, and English Russet. These are all good, and I should not care to spare many of them from my orchard. In pears, Doyenne Dete, Tyson, Clapp's Favorite, Bartlett, Flemish Beauty, Howell, Sheldon, Buerre D'Anjou and Lawrence, are among the best. Of cherries, Early Richmond and May Duke are about the most reliable. I think the time is nearly here when improved fruit-houses will enable us to keep the finer varieties until late spring; and when that is the case, many varieties which are now valued only for their keeping qualities, will give way to something better. A young orchard should, if possible, be cultivated for at least five or six years after planting, when it may be seeded; but I would not allow it to remain seeded more than one or two years at a time, until the trees are nearly or quite full grown. It will do no harm to crop an orchard, providing you bear in mind the fact that when you grow a crop of corn, wheat, or clover, and a crop of trees and also one of fruit on the same ground the same year, you should remember to manure accordingly. If you do not, it will be but a few years before you will conclude that your orchard is running down, and that "Fruit growing don't pay anyway." Another plan followed by many of our best orchardists is to seed the orchard when nearly full grown, and pasture it with hogs. Mr. J. R. Hurst, of Ross county, adopts this plan. He informed me recently that he gathered this fall about 3,000 bushels of fine apples, and was so well satisfied with the plan that he would pasture his neighbors' hogs in his orchard free if he did not have enough of his own. They destroy the wormy apples that fall, and thereby greatly diminish the per cent. of wormy ones the next year.

Pruning should be attended to annually, or better yet, semi annually. There is so much difference among the authorities as to the proper time to prune, that some one has summed it all up and said that "the best time to prune is when your knife is sharp." It is generally acknowledged, however, that a wound made in mid summer at about the time the first growth ceases (usually early in July) will heal quicker than if made at any other season. It is rarely possible to find time to do the work then however, and the foliage at that time obtrudes the clear view of the trees, and makes the limbs heavy to handle. My own choice has been February, or as soon thereafter as the weather was warm enough. I also strive to go over my trees in June, to remove water-

sprouts and superfluous limbs which start, as I find in this as in most other cases, prevention is better than cure. We should begin the pruning of the tree when we are planting, and attend to it carefully every year thereafter, aiming to start the tree so that it will never become necessary to remove a large limb, as that is certain to cause more or less injury to the tree. Different varieties of trees require different pruning according to the habit of growth. The height at which to form the head varies according to the variety. Upright, erect growers can be headed lower than those of a more spreading nature. As a rule, say four feet for apples, and two to three feet for pears. This is rather lower than usual, but I think trees headed as low as this will do better for several reasons. There is less length of trunk to be affected by disease or insects, and what there is, is shaded by the top. The fruit is not quite as apt to be blown off, nor the tree blown over by the wind. The old rule of judging the condition of a sheep pasture by the condition of the sheep, applies to the soil of the orchard. If the trees look healthy and thrifty, and are making a moderate annual growth, it is best to "let well enough alone," as too rapid growth is not conducive to health and longevity. Wood ashes, bone dust and stable manure are excellent fertilizers, or clover may be sown and fed off on the ground by hogs, or cut and thrown under the tree as a mulch. Apply fertilizers late in fall or in the spring. If put on during the growing season, there is danger of inducing too late growth, and consequent injury by the winter. A very cheap and effectual means of destroying the codling moth has been discovered. Mr. Moody, of Lockport, uses one pound of London purple to 200 gallons of water, and sprinkles the mixture on the trees two or three times during the growing season with a fountain pump. He places the barrel or tank containing the mixture in a wagon. The fountain pump is geared onto the wagon wheel, and with one man to drive the team, and another to direct the stream of spray, he sprinkles the row of trees as fast as he can drive down one side and up the other. To prevent injury to young trees during the winter, I prepare the following mixture, viz.: One ounce carbolic acid, one gallon strong soap-suds, dilute with two or three gallons of water; apply this to the trunk of the trees with a swart. I have used this for a number of years, and have found it very effectual.

As to the profit to be derived from an orchard, it would seem that any intelligent person who studies carefully the question of supply and demand, cannot fail to see that any one who will select suitable soil, fit it, properly plant the right varieties, and give them the necessary care, cannot fail to be well paid for his labor and expense. One reason why so many of the orchards throughout the country are unprofitable is because they are not composed of the proper varieties. There are too many worthless varieties. I think I might safely say that in three-fourths of the orchards in this vicinity, three-fourths of the income is derived from one fourth of the trees. The one-fourth having to pay for nearly all the care and expense of the entire orchard. No wonder there is little or no profit. It is evident to any observing person that the consumption of fruit per capita is rapidly increasing. The people are consuming more fruit and vegetables, and less "hog and hominy." The consumption is also largely augmented by evaporating establishments which condense and preserve the product, making it available throughout the entire year, and increasing the ease of transporting it. This tends to increase the consumption and demand, as also the fact that Europe will take millions of barrels annually at remunerative prices, and that a very great share of our own country cannot successfully grow good apples and pears; and even the most obtuse mind cannot fail to see that the future demand for these fruits cannot be otherwise than active. It is true it requires more care and skill to raise fruit now than it did formerly,

but care and skill are profitable servants to employ. They can earn us a thousand dollars a year where muscle can earn but three or four hundred, and eternal vigilance is the price of the highest success in any calling.

FARMERS' SCHOOLS.

BY H. G. TRYON.

[Given at the Wayne County and the Richland County Institutes.]

“The country schools are emphatically the farmers’ schools.”—L. N. BONHAM.

Perhaps the most important of all the public duties devolving upon a community is a proper and correct management of our common schools. Religious organizations, the rights of citizenship, institutions for advanced education, the public roads, the endless round of other public improvements for the mutual benefit of the whole people, have their claims upon all, but at the foundation of these, in our republican form of government, are the common schools.

The common school system of Ohio is justly the boast and pride of her people. It is probably not the best in the Northern States, and we are prone to believe it is not the worst. It shows a commendable magnanimity in the people of our State that they pay an annual tax of nearly ten millions of dollars with a view to the education of all her children without regard to race or condition.

It is for the farmers to see to it that their share in this vast expenditure is used to the best advantage. To a great extent the country schools are what farmers see fit to make them. How many of us do what we might to make them what they ought to be. The city and village districts, and many special districts, have an advantage over the township districts in a concentration of scholars, which makes the graded system practicable.

The graded system affords advantages of classification not possible in the country schools as now managed. It affords a reasonable limit to the number of classes allotted to each teacher. It separates the younger from the older pupils, and classifies them according to their attainments. Thus it greatly simplifies the government. It gives the coveted chance for an increased number of studies, and higher branches than are practicable in the sub districts of a township.

Out of these advantages has grown the possibility and custom of continuously employing well trained teachers, who have proved their scholarship, tact, and adaptation to the work. Usually these teachers and schools are placed under able and careful supervision.

A stipulated course of study as arranged by educators of long practical experience, with a regular daily attendance of scholars the entire school year, enables the pupils to progress regularly from one study to another, and from the lowest to the highest department. The classification thus enforced is a great incentive to parents to keep their children regularly in school, and every pupil understands that advancement to a higher grade is the reward of scholarship.

To these advantages of the graded schools are added commodious school rooms, with the best appliances for teachers, and an application of the best devised plans for the instruction of pupils to secure the most rapid advancement consistent with thorough work. If other evidence were needed in favor of classification, it is enough to revert to the fact that prior to the adoption of the graded system the country schools, though less efficient than now, were, for manifest reasons, far ahead of those of the cities and villages. Then careful parents shrank from the overcrowded and inefficient city schools, and established private or select schools at private expense. To-day it is the boast and pride of parents that their children are graduates of the public high schools.

To the above the farmers' schools, in a multitude of instances present a striking contrast, a contrast, as I believe, far greater than the circumstances warrant. In short, a fair portion of the difference is directly chargeable to the neglect of boards of education, local directors, and parents. It is true we labor under the disadvantage that the children are scattered. We might concentrate them to reap the benefits of the graded system, but that requires changes too radical to be accomplished in this generation.

The plan of gathering children at the center of each township, on a plan of gathering milk or cream to a butter or cheese factory, has long been discussed, but has really met with but little favor. To concentrate the pupils into four graded schools in a township would be more feasible. But these plans are not so near realization as to warrant neglect of our present system. We must of necessity, then, it would seem, continue to group together under one teacher all the branches of study from the alphabet up. Unfortunately this requires a large number of recitations, and very brief time to each. Consequently none can receive justice; or if proper time is given to one class, it is at a corresponding neglect of others.

This evil is needlessly aggravated in various ways; largely by lack of uniformity in text-books. Boards of education often fail to comply with the law which requires them to designate what text books shall be used in their respective townships. If text-books are named, local directors utterly neglect the enforcement of the law.

Parents many times have little knowledge of the requirements of the board, and neglect, or absolutely refuse to furnish the books named, and frequently demand for their children studies outside the stipulated course. Others fail to supply text books at all, or at best, one arithmetic or one geography or grammar, must suffice for a family, or it sometimes occurs that the children are sent with old, worn out, superannuated books, outside of any respectable system, each if used requiring a separate recitation.

The hiring of teachers is left by law to local directors. Two terms a year is the custom, and it is not uncommon to change teachers every term. All teachers are liable to have their hobbies or favorite authors, and, in the absence of controlling authority, call in different text-books and extra studies and classes to add with the above, to the general confusion.

Thus it is not uncommon that from thirty to forty different recitations and other exercises must be crowded into the space of six hours. Another serious evil growing out of a frequent change of teachers, is in their ignorance of the standing of the pupils, and in their inability or neglect to make proper examination.

The result is that at the commencement of each term there is a general re-organization. All alike are started in at the beginning of the book to go over the same ground in geography, grammar, arithmetic, and history that has perhaps been worn thread-bare, to reach about the same page at the close of the

term, always beginning but seldom completing a study. This of itself is a prolific source of indolence and lack of interest in their studies on the part of pupils, and habits of indifference, lack of thought and application are engendered hard to eradicate in after years.

Thus, while our children should leave the common schools with a thorough knowledge of the branches taught, it is rare indeed that they are able to bear a creditable examination as future teachers without first having received the advantages of schools of higher grade. Parents very often add to the disadvantages by keeping their children out of school for the most trivial reasons, dropping out their lessons and making it impossible for them to maintain a standing in their classes. Many a farmer's son, after reaching an age where he can be made of service, and that is often when he is very young, never has the advantages of school except during the winter terms, and this to be broken in upon whenever extra help is needed at home. Under such discouraging circumstances, what wonder that the would-be pupil becomes a burden to be carried by the teacher, a clog to his classes, and his school-life an annoyance to himself. What base slander that farmers' sons with such advantages—and a few may be found in almost every district—must be branded as natural dolts and blockheads, and what wonder that farmers' schools fail to fulfil their mission.

Another point in which parents are sometimes remiss, and which works particular harm to the country schools, is in failure to supply their children with appropriate literature at home.

It does not require the eye of a critical observer to see that children who have been supplied early and liberally with attractive books, and thus, with the aid of their parents and older members of the family, been made familiar with the alphabet and the formation of words in our needlessly intricate orthography, have a great advantage over those who have not been supplied with these helps, nor have been early taught the form and use of letters. It would be far better for the schools, and especially for the ungraded schools, as well as for the children themselves, if parents would universally teach them to read before arriving at school age and before entering a school room. If the proper means are thrown in the way of the child, and their most natural inquiries answered this can be done without taxing either child or parent. On the other hand, if reasonably well managed, a gradual system of teaching becomes a source of pleasure to both. I believe it to be true that in nearly all our sub-district schools, during the winter term, may be found boys grown nearly to manhood, who, from causes enumerated, can not read a sentence correctly nor intelligently, but who go mumbling through their lessons with only a vague idea of the correct manner of the spelling, pronunciation or meaning of the words before them.

Their chances for education are thus blocked by parental neglect, for how can we expect our sons and daughters to progress in scholarship without first having learned to read readily, and well.

None feel more deeply their unfortunate position than these pupils themselves. They do not see the road to advancement, and the evil can only be remedied by a devotion of time and labor, out of the power of a district school teacher to command. Unfortunately, the great bulk of school teachers in the country take up the business only as a make shift for the time being. Frequently for a single term. The country schools almost invariably take the beginners. Frequently they are young and altogether inexperienced in management and government, immature in judgment, deficient in education, or in knowledge of a proper system of teaching. Partly from a desire to encourage a laudable, but misdirected ambition, but mainly from a disposition to employ at the lowest

possible price and least trouble, our schools are left to suffer from the inefficiency of this class of teachers. Local directors are often ignorant of the requirements of the law, or of the conditions necessary for a successful school, or negligent of what is to them a thankless job.

School-houses and grounds are sometimes left for years in a shiftless and comfortless condition, and teachers are required to endure with the children the discomforts as best they may, without oversight or encouragement. The sub districts of the township very generally act independently of each other in the purchase of supplies, the employment of teachers, the amount of wages paid, the time for the opening and the closing of school terms.

As a result there is a general lack of that system and co operation which ought to exist in each township, and which the first principles of efficiency and economy demand.

Many districts *limit the school year* to the lowest number of weeks required by law (twenty-four), and from two hundred to two hundred and fifty of the schools of the State annually fail to comply with this low limit.

In the face of these facts, able men urge *the introduction of more studies* into this overcrowded, neglected, and unsystematic school system, some desiring one, and some another set of the highest branches.

At the meeting of the Ohio State Agricultural Convention, January 14, 1884, Hon. W. N. Cowden, then President of the State Board of Agriculture, in his annual address said: "I would recommend that those branches that are fundamental to agriculture, viz : Chemistry, botany, geology, and physics, be required to be taught in the common schools of the State." Higher arithmetic, algebra, philosophy, rhetoric, physiology, physical geography, etc., have their advocates, and are frequently crowded in by ambitious parents or teachers.

The Committee on Agriculture of the Pennsylvania State Grange, in a series of resolutions introduced the following :

"Your committee fully recommend the placing of text-books on agriculture, hygiene, and physiology in the curriculum of our common schools, to be there taught in connection with such other studies as are practical."

The *Ohio Farmer*, in an able editorial on "The Farmer and the Common Schools," gave the resolutions and the action of the Pennsylvania State Grange a most hearty indorsement.

Under the present organization and management of our township schools, I submit that these well intended suggestions and innovations, notwithstanding the eminent sources from whence they come, would, as a rule, be utterly impracticable. Here, for the best good of the whole, the inevitable primary, with the common branches, *must* receive the first attention. The time of teachers should be, and if successful, must be devoted to these. To override them with advanced studies, is simply to favor a *few* to the detriment of the *many*. It would be giving the time to the bright and ready learners to the neglect of those who most need the attention and assistance of the teacher. It is true that, under the law, schools of higher grade might be established in every township. Though this law has been quite freely discussed, boards of education have failed to see the way clear by which the end sought could be reached. Out of 11,603 school houses or school rooms under the charge of township boards in the State, but thirty-seven are devoted to schools of higher grade. The character and efficiency of these thirty-seven schools may be inferred by the average number of weeks they have continued in session and the wages paid during the last school year, lady teachers having been paid \$31.00 per month, and average sessions, twenty-six weeks, or two weeks more than the law requires. It appears then that of the 1,355 township boards of education in the State, only thirty-seven at most have availed themselves of the law to give their children higher advantages at the public expense, and these by feeble efforts.

Practically, there has been no substantial advancement in this direction, and for the very good reason that the sub-district schools have laid no foundation for success, and they never can do it while they scatter their forces and do their work without this end in view.

What are the remedies for these neglects, and what is our duty as farmers, responsible for the bad or good management of our own schools; responsible for the squandering or for the economical use of the vast amount of money expended?

First, I would suggest that at all meetings of the Granges, Farmers' Institutes, Farmers' Clubs, and in farmers' papers our school system and its workings be made a topic for discussion until the law, and our privileges under it, are well understood. We must devise means by which those parents can be reached who neglect the education of their children. We must endeavor to induce all parents, so far as possible, to give their children a good start in reading and writing at home, and before they arrive at school age, to create a love in them for books. We should dwell upon the importance of *daily attendance*. When a child commences a term at school that should be the sole business. "One thing at a time" is a sound and sensible business maxim.

To the schools we are under double obligation, because not only the success of our own children, but the best interests of the whole school are at stake. Regular attendance on the part of *all the* pupils is vital to the greatest success. Farm work in summer, or threshing, butchering, preparing fuel in winter, or social gatherings should not be allowed to interfere to the extent of breaking in upon a day at school, or even so much as to cause an excuse for tardiness. By this I do not mean the child should be without work. The inclination of a child is to *do something*, and this inclination should be encouraged from the beginning. Not coerced but persuaded and directed into useful channels. It is just as easy to allow children to make themselves useful as it is to turn them over to mischief, and they should have their moments and regular hours of work as well as of play, in which they should be carefully and kindly guided and encouraged, care being always taken to give them the reason why whenever occasion demands or opportunity offers.

The tendency to fault finding and local jealousy in sub-districts, too common with parents and pupils, should be avoided. We should scrutinize our own acts, and agree to work together for the good of the school. Teachers cannot be perfect, and all parents cannot be exactly suited, but if all unite to make the most out of such as we have, we are not likely to have bad schools. Pupils should be encouraged by parents to obey strictly the rules of school. Impress upon them the importance of this maxim, "That if they would command, they must first learn to obey." It is hardly possible that a pupil will have difficulty with a teacher or dislike his school if he obeys orders and gives strict attention to his lessons.

It is by educating ourselves up to what is most economical, most efficient and practical under the school laws that we may get our boards of education out of the rut in which they have for years been making such little progress. The semi annual meetings of the boards as conducted afford small chance for discussion of advanced ideas and improved methods; hence the importance of maturing beforehand, by public and private effort, plans to be adopted.

Directly in this line of work is the question of township supervision. Section 4017 of the school law grants to the boards of education "full power to employ a superintendent of schools for each township." Section 3982 explains how he shall be elected by the board, and section 4059 states that "the board may require superintendents to report each year such matters as they deem important or necessary for information in regard to the management or conduct

of the schools, and to make such suggestions and recommendations as they may deem advisable relative to methods of instruction, school management, or other matters of educational interest. This has been part of the school law for years; yet it has apparently come to the notice of but very few, and but very few boards of education in the State have availed themselves of its benefits. If this provision of the law is brought fully to the attention of the people I believe it will, from its intrinsic merit, be generally adopted. In many States the employment or election of county, district, or township superintendents is made compulsory. The Ohio law is a good one, and the people should no longer have it a dead letter. Ladies as well as gentlemen are justly eligible to the office of superintendent under this law. As now managed, teachers are given charge of the schools, and no effort is made on the part of directors or parents, generally, to know what kind of work they are doing, except perhaps by indefinite inquiries of the children.

Their information is frequently misleading, and very often results in needless and baseless fault-finding, to the detriment of the schools. This matter of employing teachers of inexperience, with no well defined system, and sending our children to pursue such studies as their fancy dictates, and without a definite end in view, is a process of squandering the tax we pay. The equivalent is meager compared with what it would be under systematic direction, and many times the results are inadequate to the amount expended. We could not do our own business in this slipshod manner without financial ruin. As directors, we are often urged to visit and oversee the schools, but, as a rule, have neither time nor inclination to do so. If we had the time, our knowledge of the business is inadequate. If we had the knowledge, there is no good reason why we should give the time without compensation. If local directors did take it upon themselves to visit their separate schools, it could not result in that unity of action necessary to a complete system. The true and sensible way is to employ a competent person to supervise the whole and bring them to a uniform standard of usefulness. It can be done without burdensome increase of taxation, and is just the thing to secure compensating results for the money annually expended. If too expensive for a single township, two or more may unite on the best talent to be obtained. What would we think of our good friend Terry if, after all his excellent writings on thorough cultivation, he should employ ten or fifteen young men, all with different views of tillage, and depend on them to grow his crop of potatoes without oversight. They may have had experience in farming, but without Mr. Terry's oversight, the results would be uncertain. Subsoiling and drainage would be left out, as taking altogether too much time and hard work. Fertilizers would be put on in the most convenient place, without reference to needs of the soil; harrowing more than once or twice in a place each way would be considered time and labor wasted; clods would not be crushed; furrowing out would be crooked; all sizes and shapes of potatoes would be used for seed. No system would be used in dropping; some would be covered with fine soil and some with lumps, some deep and some shallow, and the growth would not be uniform. Tillage would not commence until the potatoes were well up and the weeds had a good start. There would be missing hills; rows would be crooked, wide in some places and fringed with weeds; narrow in others and torn by the cultivator. Bugs would devastate, and the whole immense field would present a ragged and unsightly appearance. With either too much wet or too much dry weather, the mutilated crop would be a failure. By a continuous chain of lucky circumstances a medium crop might be harvested, yet it would not pay. With Mr. Terry's direction, that army of hands would first be instructed in just what was necessary to grow a good crop. Reasons for every step in its

cultivation would be explained and enforced. Organization and united action for a definite result would commence from the start. Drainage, fertilizing, ploughing, sub-soiling, pulverizing, and harrowing would all be done at the right time, in the right place, and when the soil was in the right condition. Seed would be prepared on scientific principles. Planting would be done at the right time and in the right way, to be followed by tillage in the nick of time, and when tillage, to the ordinary observer, would seem superfluous. Not a weed would be allowed to appear. Bugs would have to seek forage in a neighbor's field, or pay the penalty with their lives. The men employed would daily see the wonderful results of system and thorough work, and daily become more interested in the results. They would justly look with pride upon the clean, mellow soil, rows straight as an arrow, and a growth luxuriant as a "cedar in Lebanon." When the crop was harvested, they would realize that they had not labored in vain, and employer and employed would receive full compensation. All these good results would grow out of having these "men of many minds" directed into the right channel by a competent supervision.

What is true in growing a field of potatoes, will be doubly true when applied to our country schools. To test this matter, the Board of Education of Willoughby township, Lake county, at the April meeting in 1882, passed, with only one dissenting vote, a resolution to employ a superintendent, and for that purpose appropriated two hundred dollars. The main points of direction were, that the superintendent should hold normal schools for the benefit of the teachers and schools every second Saturday during the school-term, and that all teachers should be employed with stipulations in the contract to attend and take part in the normals. It was resolved that the first term of all the schools should commence on the first Monday in September, and continue ten weeks; the second term, on the third Monday in November, and continue sixteen weeks, exclusive of one week for the holidays; the third term, on the first Monday in April, to continue ten weeks: thirty-six weeks in all.

It was made incumbent upon teachers to organize classes in all text-books prescribed by the board, and in no other, and the superintendent was required to see that this rule was strictly enforced. Special efforts were to be made to secure regular attendance and a systematic course by the pupils in all the branches, to induce the classes in all the schools to keep pace with each other, and the lessons in the normals to cover the lessons of the following weeks in the sub-districts both in matter and manner of teaching. Principles of school government and plans of management in special cases also to be discussed by the teachers that the superintendent may know their qualifications, and assist and advise where aid is needed. The superintendent is required to keep a record of the standing and prompt attendance of teachers upon the normals, and report at each meeting of the Board. We are now on the fourth year. We pay our superintendent \$3.00 per day for the time actually employed. He holds an average of 18 teachers' meetings or normals each year. The contingent expenses do not exceed \$16.00, or \$70 00 per annum, for this branch of the service. Who is there in this audience that does not think this service faithfully performed would be worth to the schools four times its cost. More money and more time expended would secure greater advantages to the schools and will pay.

To an inquiry to our superintendent, Mr. Merrill, as to what had truthfully been accomplished by supervision, I received the following statement:

"*Dear Sir:* There is a list of statistics on file, but not now at hand, regarding daily attendance, tardiness, truancy, and other matters of like nature, showing decided improvement. Some of the other facts concerning the work

are as follows: Language, as such, has received more attention than it formerly did. This has led to a variety of work in all the grades. Sentence-making in reference to the technical study of grammar has been a constant work. The higher work of essays has been a subject constantly before the teachers. Analyses of topics has been given, and thorough instruction placed before the teachers to be carried to the pupils. Essay books for the preservation of such work have been secured to the pupils. Examinations as conducted have been a stimulus, as pupils and teachers were under the spur of competition with each other. Every school had the same questions, and the pupils knew that upon the effort of each one depended the reputation of their own school. Government has improved, and better mental discipline has been sought and obtained; the ability to think well in any given direction has been fostered. Reading is another matter that I think has improved, as a result of our work. We shall be able to graduate fifteen to twenty pupils at the close of the coming spring term who have been taken through the course prescribed by the Board."

But I will not quote further. I have taken particular pains to inquire of the teachers I have met, and they speak in high praise of the benefits received and of its importance to the schools.

On June 18, 1883, the board of education of Beaver Creek Township, Greene county, employed a superintendent to devote his time to the schools, at a cost of about \$650 per annum. He took it upon himself to visit negligent families, as well as the schools and results have been remarkable. His report may be found in the annual report of the State Commissioner of Common Schools for 1884, commencing on page 9. I commend it to the careful perusal of all interested in the country schools.

Earnest educators have worked at this problem for years, and have solved it for the cities and villages. They have also done a great work through teachers' institutes for the country schools, but these, like moral suasion and Murphy pledges in the temperance reform, good and necessary as they are, cannot strike at the root. The indispensable preliminary work *must* receive the aid of executive authority in order to pluck the ripe fruit.

If we care ever to reach that standard where schools of higher grade can be maintained in the townships, it must be by reducing our sub-districts to this thorough system, confining our children to the regular succession of studies, and imperatively completing them before admission to the higher grade. In short, our children must start in the beginning with that end in view. To accomplish it, our schools must continue uniformly thirty-six weeks to the year at least.

If *one school of higher grade* is established in each township, the location must be such as to accommodate to the very best advantage the entire township. If but one teacher is employed, the course would of necessity be limited to a few studies. Whatever the course selected, it should be strictly adhered to. No pupil should be admitted unless first having completed the common school course, and for these higher-grade schools no teacher should be employed unless a graduate coming with his diploma of scholarship, able to secure a three to ten years' certificate from a competent board of examiners.

Common sense should be exercised in taxation, and the policy of establishing such schools would be questionable except in townships where the regular attendance would be sufficient to reduce the cost for each pupil to a reasonable tuition. No doubt it would be cheaper for boards to pay tuition where village schools exist than to maintain separate schools.

Whenever a neighborhood is populous enough to concentrate pupils for two teachers, boards of education should establish a graded school, but no extra studies should be allowed, and teachers should be employed at the average

wages so that no injustice to tax-payers would result. This would give the advantages of grading where the proper conditions exist without extra cost, would do injustice to none, would remove the cause for special districts, and do away with the pernicious interference to our system of local taxation caused by them.

School-houses in large sub-districts should invariably contain an extra recitation room where advanced pupils may be employed to take charge of a few primary classes, thus giving more time to recitations.

The law should be so amended as to require the employing and discharging of teachers by the boards of education, and not, as now, by local directors. This would be a bar to the frequent change of teachers, simply on the caprice or whims of individuals. Local directors should be simply the agents of the higher authority of boards of education in all matters of expenditures, and in none be able to set that authority at naught.

We can not expect uniformly good schools until our teachers are thus employed, and under contracts by the year, not by the term. It would be a great saving of time and labor, both to teachers and directors, if all applications by teachers for schools were sent directly to the board of education, at the April meeting. With the assistance of a township superintendent likely to know, in a majority of cases, the true qualifications of the applicants, better teachers would be secured, and continuous employment would insure progressive work.

Text-books for the schools should be uniform throughout the State. As the law now stands, it is the duty of each township board to establish a series of text-books for their own schools. Under this arrangement, every township may select different books, and if they give heed to the law, they are liable to ring all the changes with different authors and publishers. Merchants, in the country, do not always keep the books desired, and many times it is impossible to get those named except by sending to a distant town or city. Thus every attempt at uniformity is crippled and retarded. Every attempt of the General Assembly to remedy this matter has been lobbied and fought against with all the immense power of the school-book monopolists. Twice, to my certain knowledge, have sound and practical measures which would have set this disastrous mixing up of text-books at rest, and reduce the annual expense to the farmers of the State tens of thousands of dollars, passed the House by overwhelming majorities, to be hotly contested in the Senate, and basely defeated by the overwhelming pressure of school-book publishers and dealers who have no motive but to take the money out of our pockets and put it into their own by the large profits of the business. While this matter was before the Sixty-second General Assembly in 1876, the publishing firm of Wilson, Hinckle & Co., of Cincinnati, offered to furnish books to any board of education at about one-half the retail price. This offer was made, of course, to head off the pending measure, but is direct evidence of the amount which might be saved to the farmers. I can see no good reason why a convention of teachers from different parts of the State might not select a series of text-books for all the schools. The General Assembly should then legislate to have these published by the lowest responsible bidders, and either furnished to the boards of education free or at cost.

Great improvement has been made in school-buildings within the last twenty five years, and yet there is room. The introduction of improved school furniture has been a great help. Music should be added; tasteful and convenient window-shades furnished; a clock, maps, pictures, and mottoes adorn the walls; and in summer, house plants furnished and cared for by the children. Good water to drink and appurtenances for cleanliness should not be neglected.

Good cloak rooms, black-boards of slate finish around the entire wall, and recitation seats at both ends of the room are necessary improvements. Choice varieties of ornamental trees should grace the surroundings, and a display of horticultural taste should not be lacking.

Gratitude is due those local directors who take pride in keeping school-houses and grounds under their charge comfortable and tidy. It is true economy to keep school buildings in the best possible condition. Children have great respect for paint, and well kept places that afford them comfort; but the boy of spirit rarely misses a chance to hurl vengeance, in some form, at a weather beaten, neglected, and comfortless school edifice. Let me again urge those men and women, now in the prime of life, with families to educate, to make themselves thoroughly acquainted with our excellent school system, and prepare themselves now to make the most of it and reap its advantages.

The influential men of the cities were country born. The great bulk of men who have acquired wealth or risen to statesmanship or great leadership were raised on the farm. It is needless here to enumerate such examples as Webster, Greeley, Gerrit Smith, Potter, Palmer, the Armour Brothers, Lincoln, Garfield or Grant.

The hot-house training of in-door life in the city does not develop that self-reliance and efficiency which makes the world move. The parlors of the wealthy are not the places where true democratic ideas are born and fostered. The street education obtained by boys of either village or city does not beget that sterling integrity of character necessary for the safe guardianship of either public morals or of our republican government.

It is from your homes that the true successors of these illustrious men must come, if they come at all, and the foundation of their future characters and future education must be laid at home, on the farm, and in the country schools. If these are so improved that all the country children may reap full benefits, and their love for country life and for a higher practical education be fostered and maintained, then the next generation of farmers may hold their true place in the councils of the State and of the Nation.

RURAL RECREATIONS.

By A. T. McKELVEY.

[Delivered at the Mt. Pleasant (Harrison County), Institute.]

The isolation of farmers and the remoteness of their homes from the centres of social life and amusements, as well as the sustained labor the husbandman and his family perform during two thirds of the year, demand more pay and less work; more recreation and less toil, or our calling will prove a dreary and monotonous pursuit from which the rising generation will shrink with aversion.

In this rushing age in which we live, the American farmer may escape the eager strife and struggle for gain that animates the populace of our cities and towns. His occupation is essentially one of peace and quietness, and ought to be exempt from the cankering care and anxious solicitude that attaches to the uncertain occupations of the town; but, alas! the grasping spirit and grinding toil is there too.

The average American farmer is driven by work from March until December.

For two-thirds of the year his life is an unceasing round of exacting toil—plowing and planting, and reaping, battling with weeds, contending with drouths, repairing after cyclones and flood-, gathering food that the world may eat; shearing fleeces that the world may wear; toiling through the heat and hurry of the harvest almost without rest and relaxation. When the looms are silent; when furnaces are extinguished, and weary merchants and mechanics are fleeing from sultry shops and crowded thoroughfares to the mountains and seaside for a breath of pure air, the farmer is toiling on; the clank and clatter of his reaper, the clicking and clashing of his mower is heard upon every hilltop and in every valley from day break until dark.

Ah, friends, poets may sing of the peace and plenty of the farm. Artists may picture the breadth and beauty of its landscape. Orators may extol the independence and integrity of its toiling tillers, but of what avail is our boasted independence if it will not procure us a day of much needed recreation? How can beautiful scenery and a health-giving atmosphere contribute to our happiness if we do not pause long enough to enjoy them? Fellow-farmers, if we would attain the highest measure of health and happiness, uniting physical strength with mental culture; if we would maintain contented minds and cheerful hearts in sound and vigorous bodies; if we would “crown a youth of labor with an age of ease,” we must devote more hours to health-giving recreation and amusement.

“But,” pleads some over worked farmer, “I can’t afford that, I have too much at stake, my work is too important to devote so many days useful for work to useless pastime and amusement.” Nay, verily, I insist that there is no occupation so important, no work so pressing that a man can afford to pursue it to the detriment of his health and happiness. Perhaps, one of the busiest men in the world to-day is the late Premier of Great Britain, the gifted and scholarly Gladstone. Yet, this man with the cares and responsibilities of the mighty British Empire resting upon him, takes time to pursue the favorite pastime of chopping wood for rest and recreation. And the intellectual giants of every land, the men who possess physical strength to endure the strain of sustained mental labor, are men who seek physical labor for rest and recreation, from the mental men like our lamented Garfield who was never so happy as when tossing sheaves and pitching hay on the meadows and grain-fields of Mentor.

If, therefore, the brain workers, the scholars, the statesmen, and the scientists need to take labor for recreation, how necessary for the farmer who calls into activity every muscle of the body, if he would cultivate his mind as industriously as he cultivates his fields, to take rest and relaxation from labor.

In addition to observing all the legal holidays, the farmer should set apart special days throughout the entire season to be devoted entirely to rest and social and intellectual enjoyment. When the hurry of the spring planting is at an end, and the farce of working the roads has been enacted; when the growing corn and ripening grain betoken a season of protracted labor, let the farmer and his family pause for a breathing spell before entering upon the arduous and anxious labors of the harvest.

A trip to the city with its busy streets and its animated sights and scenes is a pleasant relief from the quiet hum-drum life upon the farm. And fishing and hunting excursions with the boys and girls will cause them to enter with more zeal and zest upon the labors of the approaching harvest.

Our horticultural friends of Eastern Ohio furnish us an example in this particular, worthy of our imitation. The summer meeting of their society is held early in June in one of God’s first temples, a beautiful grove. There the old and young of both sexes assemble beneath the outspread arms of giant

oaks for a day of unrestricted pleasure. There is foot-ball and base-ball and quoits for the boys, with croquets and swinging and other amusements for the girls, with spicy speeches interspersed with spirited music for the children of larger growth. But the crowning event of the day is the feast, for unto the abundance of substantials there have been added bushels of berries. The best cultivated plantation in that celebrated strawberry region has contributed of its most luscious fruit to grace the occasion, and when the day's festivities are ended, all return to their homes refreshed and invigorated. And when the harvest is past, and the bursting barns of garnered grain, the innumerable stacks of fragrant hay, and the countless fields of waving corn, attest the beneficence and bounty of God, let us come together again for a joyous harvest home. A day in which to publicly acknowledge, and publicly express our obligation to the Supreme but loving hand, that has not in all the season that is past withheld a needed blessing or bestowed a merited curse.

A day thus spent where old and young, grave and gay unite in innocent sport and harmless pastimes, will linger a green spot in the memory that will serve to lighten the labor and relieve the monotony of many an after-day of weary toil.

Again, when the fall seeding is finished, and stinging frosts and falling leaves warn us that the mast crop is ready to gather, when the whole face of nature is brightened by the beautiful tinting of the forest trees, and the sun shines soft and mellow through the haze of an October day; when upland and valley are checkered with shocks of rustling corn, and the orchards are bending low beneath their burden of golden fruit, let us hie away to the woods with wife and children to harvest the winter store of nuts. One who has not tried it, can scarcely imagine what a joyous romping, rollicking day it will prove to old and young.

But of the various holiday occasions throughout the year, the agricultural fair is pre-eminently the farmer's holiday. Perhaps, no event in the year is looked forward to with more pleasurable anticipations by the average farmer and his family than the annual exhibition of our county or district fairs. Indeed, one of the primary objects in the establishment of agricultural fairs was for the purpose of affording the rural population a day of needed rest after the exacting labors of the harvest, and the opportunity for social intercourse and enjoyment, but this laudible purpose has been subverted by the introduction of pastimes and amusements of a riotous and rollicking nature which have proven destructive to the peace and placidity of those hitherto moral societies. The admirers of the notorious "Donnybrook Fair" are endeavoring to introduce its peculiar features into our American institution. First, horse racing crept in with its attendant evils of betting, brawling and profanity. Then noisy shows of doubtful morality were added as a fitting accompaniment to the vices of the speed-ring. Afterwards games of chance, pool selling, wheels of fortune, and every conceivable device for entrapping the unsuspecting and confiding were admitted, and finally the beer saloon with its drunkenness and debauchery was introduced as a crowning evil to this pyramid of demoralising features.

The agricultural population are clamoring for a reformation in the management of their fairs, and I know I but voice your sentiments when I say if these so-called agricultural fairs cannot be maintained without the demoralizing attachments, in the name of all that is righteous, let them die. Better that an agricultural fair should never be held than that an institution in the guise of agriculture should be conducted for the dissemination of vice, intemperance and immorality.

When winter has locked field and forest in its icy embrace, the farmers

vacation properly begins. Then the sleighing parties, singing circles, reading unions and farmers' institutes, with their hours of social intercourse, and pleasant and profitable enjoyment, rob winter of its dreariness and discontent.

I need scarcely dwell for a moment upon the benefits and blessings of farmers' institutes to an intelligent audience like this, but I crave your indulgence for a moment while I touch upon the mental and moral influence exerted upon the young men and young women of rural districts by singing societies and reading circles.

In my own immediate neighborhood there are formed a number of branches of the Chautauqua Literary and Scientific Circle whereat scores of young people, pursuing a systematic course of reading and study, meet weekly for literary exercises and social enjoyment. These organizations afford opportunities for mental culture to young men and women thirsting after a higher education, but from lack of means or time debarred from pursuing a collegiate or academic course. Of the 70,000 advocates of the Chautauqua idea living throughout the length and breadth of our land to-day, two-thirds dwell in rural homes, and the mighty influence they will exert upon the agriculture of the future, no man can ever guess. I commend their example to the young men and women within the hearing of my voice to-day who devote their spare hours to reading the sensational fiction or the equally unprofitable fribble and froth that is so conspicuous in much of the current literature of the day.

After the reading circle, I think of no exercise that affords so much genuine pleasure to old and young, that fills the mind with nobler desires, and the heart with more generous impulses than the singing circle or class. Therefore, we should encourage the youth of the farm to form singing societies, not simply as a means of recreation but for the refining and elevating influence they will exert upon their lives.

There is a power and pathos in song that cannot be expressed. There is an influence and an inspiration in music that cannot be measured. A great statesman once said, "let me but make the songs a nation sings, and I care not who makes its laws;" and no one here to-day who passed through the bloody struggle for National existence, and recalls the patriotic fervor aroused in the hearts of loyal men at the singing of national hymns will deny the force of this statement. A story is related of Bishop Rosencrans, the eminent Catholic prelate, who was sent to Rome to exert his mighty influence with the Pope, in behalf of our distracted country, that will serve to illustrate this point.

It was during the darkest hours of the Rebellion, when the life of the Nation was trembling in the balance. Every mail from home brought to the Bishop news of fresh defeats and reported disasters, until his heart was oppressed with grief and melancholy. One day as the vessel upon which he was sailing was lying at anchor in the harbor of Genoa, the Bishop was sitting in the cabin brooding over his country's woes, when he was called upon deck to listen to a band that was playing sweet melodies in the garrison on the cliff. Casting his eyes over the beautiful bay he discovered that of the hundred or more vessels lying at anchor in the harbor or plying hither and thither, not a single craft was flying the Stars and Stripes, and the thought that the privateers of the enemy had driven his country's flag from the commerce of the seas only added to his depression. As he gazed far out to sea he saw a full rigged vessel with flying streamers and every sail expanded to catch the breeze and enter the harbor. He wondered to what nationality she belonged, and what flag she was flying, and as he watched and wondered the vessel swept majestically around the outer pier and passed beneath the frowning guns of the fortress. Then, as is customary for ships entering a foreign port, her colors were run up to the mast head,

and before the eager eyes of the Bishop could discern the glorious flag of his country in its fluttering folds, the guns of Italy had fired a salute to the Stars and Stripes, and the band entering into the spirit of the occasion, struck up "The Star Spangled Banner" "Oh!" he said, "the ecstasy of that moment no words could express!" His heart bounded with delight at the sight of his country's flag, while his ears were ravished with the music of the national hymn.

Music not only inspires patriotism, but awakens the tenderest emotions that stir the human heart.

"Music will soften where language will fail us, feelings long buried 'twill restore,
Tones that were breathed from the lips that are silent, ah! how we revere them
when they are no more!"

And, oh, how it arouses love and causes the heart to flutter, the cheek to glow, and the eye to glisten in men and women of every race and every clime.

Bayard Taylor expresses it in his inimitable "Song of the Camp:"

"Give us a song, the soldiers cried,
The out-r trenches guarding,
While the heated guns of the camps allied
Grew weary of bombarding.
They sang of love and not of fame;
Forgot was Britain's glory,
Each heart recalled a different name,
But all sang Annie Laurie.
Dear girl, her name they dare not speak,
But as the song grew louder,
Something upon the soldier's cheek
Washed off the stain of powder."

Finally, music and song assuages anger and wrath, and causes the bitterest enemies to forget for the moment the hostility existing between them, for "one touch of Nature makes the whole world kin."

In the spring of 1863 when the Confederate and Union Armies confronted each other on the banks of the Rappahannock, it chanced one evening that two bands began to discourse sweet music about the same hour upon the opposite banks of the river; the friendly pickets consenting, crowds of soldiers began to collect on the northern and southern shores of the stream to listen to the concert. First, the Union band played "Hail Columbia," "The Star Spangled Banner," and other patriotic airs, when the Federal soldiers would encore with three cheers and a tiger. Then the Confederate band would strike up the "Bonnie Blue Flag" and "Maryland, My Maryland," when the Confederate soldiers would respond with the old rebel yell, given with vigor and vim. At length one of the bands began to play the touching and plaintive strains of "Home, Sweet Home;" in a moment the other band joined in the refrain, and the boys in blue and the boys in gray, facing each other across the stream that had often been crimsoned by the blood of their fallen comrades, listening to the sweet, pathetic song, forgot the hostility existing between them; forgot the strife and cruelty of civil war. For, as the last tender notes came floating in the air toward them, a mighty shout went up from both sides of the river, proving that the strain had touched a chord that beats responsive in every heart.

And so, friends and neighbors, I have thought that when the warfare of life is ended, when its turmoil and strife are o'er, and we stand upon the banks of the dark flowing river, listening to the sweet melodies that come floating to us from the farther shore, our anxious ears will hear the welcome notes, and our eager hearts beat responsive to the glad refrain of "Home, Sweet Home."

HOME ADORNMENT.

BY. F. R. PALMER, OF MANSFIELD, OHIO.

[Delivered at the Holmes County Institute, Mt. Vernon, Ohio.]

In agricultural assemblages, the time is generally occupied in discussing the best methods of tilling the soil in order to produce the best results by increasing the pecuniary profits of the farmer. This is quite proper and commendable, yet it is possible to confine ourselves too exclusively to these things, while other matters of equal importance are neglected. For, while we are improving and multiplying the products of the farm, we may develop and improve the man, and also add much to our comfort and happiness by improving and beautifying our home surroundings. Too many of us are inclined to look with disfavor on anything that does not promise pecuniary gain—anything that can not be taken to market.

Now, we will take it for granted that every intelligent person will admit that the accumulation of wealth is not the true measure of success in happiness in life. The farmer, of course, should "make his farm pay." It is evidence of skill, industry, and capacity. But this should enable him to secure more of the comforts of life, the means of self culture, and more intellectual enjoyment. We regard it as a decidedly narrow view of things to attach value only to that which can be turned into money. To appreciate fully the praises which poets have sung of rural life, it is necessary that farming be relieved of some of its drudgery. It is all very well for artists to paint and orators to eulogise the charms of the farmer's life, but while these glowing fancies fail to relieve him of his burdens, or in any way elevate his condition, his enthusiasm is not likely to get much above a normal temperature. The plain, unvarnished truth is, that unceasing toil and drudgery, with no time for mental culture or recreation, does not inspire the young farmer with romantic ideas of his pursuit; under such circumstances he fails to discover the charms of the farmer's life. It is impossible for human beings to be what they should be in civilized society with a constantly overtaxed physical frame. Hence we should endeavor to perform the necessary work of the farm in the most sensible manner, and by the least laborious methods; not that we dislike work, but that we may work to better advantage and accomplish more in a given time.

Brains, as well as muscle, should be recognized as essential on the farm; and intelligent system should supercede mechanical routine. If the real object in life is to be happy, we should neglect none of the means to secure happiness; we should live for health and happiness, instead of sacrificing both for a mistaken idea of life. In the pursuit of wealth, we should not shut up our hearts and minds to everything else; for we are beings supposed to have minds and souls as well as bodies, and therefore should not exhaust all our energies in needless labor. A first-class washing machine, clothes wringer, force pump, rotary churn, with fly-screens at doors and windows, and a first-class sewing machine, will vastly economize a woman's labor, sweeten her temper, increase her comfort, promote her happiness, and that of the whole family.

Too many farmers are careless in regard to providing comforts in the way of ornament, such as neat fences, smooth lawns, and shubbery. They have no shade, no flowers; nothing to make home cheerful, nothing to inspire the family to sing "Home, Sweet Home." Dilapidated fences, loose boards, old

barrels and barrel-hoops, worn out farm implements, etc., too often decorate the home surroundings, especially the back yard; while pigs, geese, chickens, and dogs contend for a position on the front porch. The whole landscape looks like a western village after a cyclone had got through with it.

This, of course, does not apply to those who attend farmers' institutes, and try to keep up with the age in which we live. They are not caught with such God-forsaken, dilapidated, and forlorn home surroundings. But if you will look around dwelling places of some of those not here to day you will see many such places called "home." Please excuse me when I say that I look upon the external appearance of every home as an index to its inmates.

The person who has no appreciation of the beautiful in nature, most certainly lacks an essential element of moral and intellectual enjoyment, and is incapable of appreciatively looking through nature up to nature's God.

In the adornment of our homes, neatness and simplicity are more charming than ostentatious display. Very few persons realize how beautiful a home can be made at very little expense, with ornamental trees, shrubs, and flowers, especially if a judicious selection of varieties be made, and proper care be taken in their arrangement and cultivation. Fewer still know how many beautiful varieties can be easily obtained. For cheerful influences that speak to the hearts of all, there is nothing like flowers. They shed a refining influence on ourselves and on our children.

The tasteful arrangement of ornamental trees, shrubs, and flowers enhances the value of real estate more than any other equal outlay in money or labor, whether it be on a large or small farm, or a village or city lot, and it is a matter of surprise to me that this idea is not more generally appreciated by farmers and others.

It is astonishing to see the vast improvement in the floral department, as well as in ornamental foliage plants, within the past few years, and these beautiful plants, when artistically arranged, become "a thing of beauty and a joy forever."

A home adorned with the beautiful in nature is generally the abode of intelligence and culture. Show me a family with no appreciation of the beautiful; that care nothing for flowers, pictures, or music, and I will show you one more or less destitute of refinement, and lacking those social and intellectual enjoyments which constitute the chief happiness of cultivated and refined human beings. Hence, we see that the ornamentation and requirements of home promote the greatest good to the community, by leaving vice in its native ugliness, and dressing moral worth in a garb of beauty.

The surroundings of city and village homes are necessarily smaller than those in the country; hence, the necessity of keeping them well sodded, neat, and tidy. The real elements of beauty in a city or village are not costly houses, iron fences, or any obviously very costly improvements. They are rather simplicity, neatness, and good taste in arranging the surroundings and keeping the lawn, and those little attentions which make you feel as you pass along the streets that it is a city or village of "homes," with all its parts adapted to the most pleasant and satisfactory living of its people.

We, as Americans, should not be willing to live without the adornments of home, the refinements of life, and the social and intellectual enjoyments of educated and refined human beings, and every farmer or business man can easily take the time, if he will, to do all that is necessary to keep the surroundings of his home neat and attractive. Our houses should be built in accordance with carefully considered plans, in order to make them comfortable and convenient, and should be supplied with all labor-saving machinery. For whatever lightens woman's burdens, increases her ability to make home happy.

Our houses should combine capacity, convenience, warmth, ventilation, and pleasing architecture. There is no good reason why they should be shells, fitted neither to defy winter's blast nor summer heat. Both exterior and interior should be so constructed as to promote health and comfort, all of which can be secured with moderate outlay, by the exercise of a little common sense and skill.

We regard it as every man's duty to make his home not only convenient and comfortable, but pleasant and attractive to his family. The proper object of all home influence is to develop character. This cannot be rightly done in unpleasant and gloomy homes. How then can any parent afford to neglect these little attentions to home when they are so easily secured. Beautiful grounds and attractive homes are not so much the result of money or extravagant outlay as of refinement and love of home, and wise economy. Let your children be brought up to love their homes, and you make them at least happier and better men and women.

Trees, however beautiful, should never be planted so near the house as to exclude the sunshine. Large growing trees are out of place in small yards. They should be in keeping with the size of the lawn they are to beautify. The white pine, as well as the Scotch and Austrian pines are rapid growers, and desirable where there is plenty of room, but not well adapted to small lawns. They grow coarse, and lose their beauty with age. Hence, the more dwarf evergreens are more desirable, and these should not be planted too near or immediately in front of the house. Sunshine and ventilation should be secured in their proper place and manner. Among the finest deciduous trees for the lawn are horse chestnut, cut-leaved weeping birch, oak-leaved mountain ash, white birch, silver maple, and our common hard maple or "sugar tree." Among the best evergreens are the Norway spruce, hemlock, white spruce and arbor-vitæ. Among the best dwarf evergreens are Lawson's cypress, retinospora, arbor-vitæ, pyramidalis, Hovey's golden and heath-leaved arbor-vitæ and Swedish juniper. There are also many hardy ornamental flowering shrubs. These require but little attention, and bloom nearly all the summer. Weigela, with variegated leaves and pink flowers, and beautiful spirea with flowers, both rose-colored and white.

In transplanting evergreens, especially great care should be taken not to expose the roots to sunshine and drying winds. They have a resinous sap, and if the roots are thus exposed it becomes thick and gummy, and no after-care or watering will ever revive them. Evergreens succeed best, planted after the buds begin to swell in spring, or about the middle of May. We regard early spring as the best time to transplant deciduous trees and shrubs; yet, it is true that—

"A careful man may plant in spring or fall,
A careless man should never plant at all."

If trees are planted in the fall, the ground should be covered with coarse manure to protect the roots during the winter.

Our homes should be significant of all that is bright, cheerful and happy; for dark gloomy homes make bad children, and bad children make bad men and women; hence, if we would charm our children into the right path, we should make home the brightest place on earth to them. We have all heard, "There is no place like home," but whether home is a "paradise on earth," "a thing of beauty, and a joy forever," or a something else on earth, is just as we make it. Do not always turn down the blinds the wrong way, but let the sunshine stream in through the windows. There is more virtue in a single sunbeam than in a hemisphere of cloud and gloom. Don't think that a little

fun and recreation will demoralize and ruin your children. The truth is, that recreation is absolutely essential to good health and good morals. Please read Proverbs 17th, 22d: "A merry heart doeth good like a medicine, but a broken spirit drieth the bones." Hence, we should infuse into our homes more innocent, good cheer. Do not cover up your walls with "death on a pale horse," and expect your children to keep step to a dead march. Give your children plenty of interesting reading, and don't confine them to "Fox's Book of Martyrs" and "Watt's Hymns," as the good parents did in olden times. We do not advise covering our reading tables with useless "sentimental trash." A little judgment and common sense is all that is needed to furnish that which is interesting and beneficial. Make the inside as well as the surroundings of your homes pleasant and attractive.

A love for the beautiful and the good is largely a matter of education. We believe the reason why so many persons have so little appreciation of the beautiful, the trees and the good is because they have seen so little of them in their homes.

GOOD LIVE STOCK ESSENTIAL TO GOOD FARMING.

BY J. C. LEVERING, LEVERINGS, OHIO.

[Delivered at the Knox County Institute, Mt. Vernon.]

According to the definition given by Webster, a farmer is one who cultivates the soil. The cultivation of the earth is the most important labor of man. Man may be civilized in some degree without great progress in manufacturing, and with but little commerce with his distant neighbors, but without the cultivation of the earth he is in all countries a savage. When tillage begins other arts follow. The farmers are, therefore, the founders of human civilization. All interests depend upon the prosperity and success of agriculture, and no man is so high as to be independent of the success of this great interest, nor so low as not to be affected by its prosperity or decline, for when the farmers are prosperous, mechanics, merchants, manufacturers and professional men all alike rejoice and are prosperous. Agriculture feeds and clothes us. Without agriculture manufacturing would decline and commerce cease. These three all stand together in a cluster, like pillars that support our social structure, but the central and largest one is agriculture. No country or nation is prospering while her agriculture is in a languishing condition.

England, until recently, has been eminently an agricultural country, and in that was the strength and stability of her institutions; but England to day is only secondarily an agricultural country. Her manufactures and commerce have relatively out-grown her former chief industries. Less than half of her commodities of daily consumption of food are of home production, but are brought from this and other countries. Parliament, becoming alarmed at this condition of things, appointed a committee to investigate and report the cause of the depression or decline of agriculture, and if possible devise some means or remedy for its relief.

By common consent, the farmer is placed at the head of the list of producers, and intimately and inseparably connected with the tillage of the soil is the breeding and rearing of domestic animals. Indeed, the cultivator of the soil,

the stock grower and the miner are the only primary producers; all other productive labor is only to add value to what these have already brought from the great store-house of the earth. Ohio is pre-eminently an agricultural and stock growing State, and no doubt this accounts for the great number of able and distinguished men that Ohio has produced for the council of this Nation. It requires more general knowledge to be a successful agriculturist and stock-breeder than for any other occupation or profession in life.

The Governor of Ohio, when called upon last month by the Ohio State Board of Agriculture, to deliver an address of welcome to the annual agricultural convention, in the Senate Chamber, not only boasted of having been a boy once, but that he was raised upon a farm, and expressed regret that he ever left that high and noble calling, and came down to read and practice law.

It is very evident that the whole influence of farm life is elevating and refining. The spirit that is cultivated among trees, fruits and flowers, and waving grain, and by the intelligent care of domestic animals is very different from that which is cultivated on the streets, or in the shops, mines or factories. Physically, mentally and morally the advantages are in favor of farm life. A large majority of our most useful men in the councils of the Nation as well as in the other callings of life come from the country, and no doubt owe their success to their early training on the farm.

The farmer needs a wide knowledge of many sciences and subjects. He should be an entomologist; should understand enough of natural history, at least that branch which pertains to insects, to know how to exterminate or hold in check the almost endless variety of insect pests that would otherwise destroy the fruits of his labor.

The farmer should be a pomologist; should be skilled in raising fruits of all kinds. He should also know enough of botany to make an intelligent use of the many valuable plants with which he is surrounded. He should be a horticulturist, for no farmer's table is complete without a full supply of good, healthy vegetables. The farmer should also understand enough of veterinary science to know how to treat the valuable animals under his care for the various diseases to which they are subject.

It is for the acquisition and diffusion of such knowledge that farmers' institutes are held, and I remember with pride and satisfaction my vote in the State Board for their inauguration, and an appropriation each year from our limited means to carry them on. They lead naturally to our Agricultural College or State University, where a fuller knowledge may be obtained of these sciences that underlie agriculture.

The general condition of agriculture in the country is manifestly improving, and closely allied to this interest, or in fact interwoven with it, as already remarked, is stock breeding.

The live stock interest is of more importance than the grain crop.

The decided improvement in the domestic animals of the State is no doubt due to the annual exhibitions of the State and county agricultural societies.

The improvement of our useful domestic animals is a subject that cannot be too forcibly urged upon the farmers of the country, and as long as there are animals of inferior quality raised, so long will it be in order to keep this subject prominently before the farmers. "Line upon line and precept upon precept" are needed to arouse the farming interest to the importance of this subject. When a practical business man becomes convinced that larger profits can be made by dealing in a certain line of goods, he is very sure to direct his attention chiefly to that line. If this is good policy for the merchant it is equally sound for the farmer. It can be safely laid down as a first principle,

at least in stock-breeding, that the best is the cheapest. This wise business maxim, however, does not exert so strong an influence on the agricultural class as the facts seem to warrant, for by following this primary principle, it is certain that a man may just as well have good stock as that of poor quality.

The same land that will keep poor animals will maintain an equal number of good ones. No more labor is required to take care of one than the other if both are cared for as they should be; while the annual profits from the sale of good stock is much greater than that of the poor.

The valuable points and characteristics of improved pure bred stock have been obtained by many years of care, labor, and skillful management in breeding to produce the best results, by producing animals that mature earlier, weigh more, and give a larger amount of prime meat, which commands a better price in market, both at home and abroad. This is eminently the case with cattle, and holds good with sheep and swine. A false notion of economy seems to have taken possession of the farmers of some localities, who continue to raise scrub stock, or at least very low grades. They do not seem to understand that such stock, though it is cheap at first, can only be raised at a positive loss, when, by the expenditure of a few dollars at first, an animal could be procured which at one year old, or at maturity, would be worth twice the amount of the one bred from some roving scrub.

Our farmers generally understand this, and are rapidly improving their domestic animals. While there are some, who, in a vague or visionary way, readily admit the fact, but have not the energy or enterprise to procure for themselves good animals at a fair price, but wait for their more enterprising neighbors to supply them, and as they never take or read agricultural papers, or attend State or county fairs, or farmers' institutes, are never posted. They are usually the chronic grumblers and fault finders, and are perhaps themselves the best representatives of the scrub stock of the country.

From every point that this subject can be viewed or examined, the benefits resulting from keeping good stock becomes more apparent, and more fully confirms the fact that the best is the cheapest.

The manifest improvement in the cattle of the country has no doubt been largely brought about through the instrumentality of the State and county agricultural societies, by the annual exhibition of the improved breeds at the fairs. The most casual observer will, at these fairs, see the difference between the square, flecky Shorthorn and the common scrub, and be induced to make the needful improvement by purchasing breeders for his locality; thus scattering them through the country; while those who are not in sympathy with the Society, or are opposing its operations for selfish motives, would avail themselves of the improvement of their neighbor by having better stock brought to their locality, and thus derive substantial benefit, provided it could be had gratuitously. Such farmers will often bitterly oppose a small levy by the proper authorities for the purchase or improvement of fair grounds. By a comparison of our cattle of to-day with those of thirty years ago, all will readily admit that they are far superior to what they were then, and that the improvement has been brought about in the way indicated. All will agree, too, that the farmer cannot afford to raise scrub cattle.

With our improved cattle we are prepared to realize the profits resulting from a large export trade, as well as the great improvement it has inaugurated in our beef for home consumption.

In all the great markets of the country the top prices are paid for the improved breeds. All our cattle dealers are now learning, as they never knew before, what constitutes true excellence in beef cattle. They must be fine boned, with light offal, and of deep and even flesh, as every one could see that has visited the National Fat Stock Show at Chicago.

The discrimination now being made by dealers in favor of good cattle is worthy the attention of all breeders. While there is a fair demand for good cattle, and the demand will continue or increase, scrubs are discarded, or bring very low prices. And what has been said in regard to the improvement of cattle, is equally true in regard to horses, sheep, and swine.

But there is another aspect in which the farming class must be viewed if we would have a just appreciation of their importance in the business of the country. Consumption is as necessary to trade and commerce as production.

Farmers are not only the principal producers, but they are nearly as important in the attitude of consumers. The farmer is a great consumer, and as such he is an important factor in the business of the country.

Look at the great cotton and woolen mills that annually turn out their millions of yards of shirtings, sheetings, prints, flannel, cassimeres, and cloths, and inquire for whose use is all this. Probably fully one half of the entire amount is purchased and consumed by the farmers.

The same may be said of the boot and shoe factories, and especially of the carriage factories, while many of the large manufactories of the country manufacture agricultural implements exclusively.

For the last two years the business of the country has been passing through a severe financial pressure, and many are the causes assigned and the remedies propounded. Some say it is over production, and that we here in Ohio cannot compete with the great West in grain growing and stock-raising; others that the farmers must organize and assert their rights. Perhaps the true secret of the depression lies in the fact that the labor of the husbandman for the last two years has not been remunerative, governed by the great law of supply and demand. I have no doubt but we are passing a new era in agriculture.

Perhaps the best remedy for the farmers of Ohio is to adopt a mixed husbandry; not try to do so much, but do it better, by enriching the soil, a more careful preparation of the same, so that larger crops may be raised at less expense, and keep only the best of our domestic animals. To this end many, though not all, agricultural writers are like guide posts at the cross-roads, always pointing the way, but never going. They are always ready to sell the product of their fertile brain to some agricultural editor at so much per column, and often have to draw on their fruitful imagination to make an article sufficiently long to hire some other man to do their work for them on the farm.

The farmer must be a man of steadfast purpose; not given to frequent radical changes. If he expects to succeed in his calling, he should mature and execute his plans with good, sound judgment, and the more of this commodity the better.

IMPROVED LIVE STOCK VERSUS THE COMMON.

BY R. BAKER.

[Delivered at the Lorain County Institute, Elyria, Ohio.]

In the discussion of this subject, my object will be to show that it is to the advantage of farmers and breeders of stock, of whatever kind, to secure the best within their reach, whether horses, cattle, sheep, or swine.

The first settlers of civilization on this continent were glad to have almost any low grade of domestic animals, from the fact that importation was too great

a risk, even if they had the means to obtain stock. Thus, for generations, but few cattle and horses were of any improved breed. Sheep were of the poorest kind, to say nothing of the swine in those days.

Nearly a century ago improved farm stock began to show itself in the Eastern States, but made slow headway for many years. As navigation rates became cheaper and the time reduced in crossing the Atlantic, importations became more frequent, so that many improved animals, both of cattle and horses, began to spread over the Eastern and Middle States, and soon became quite numerous in Kentucky, and finally reached Ohio. Many persons secured them for speculation, and for quite a time they were kept at such high prices that the general farmer could not obtain them. So soon as the farmers of Ohio and the West had subdued the heavy growth of timber and raised sufficient crops to meet their expenses they began to purchase cattle, horses, etc., but to many of these farmers a cow was a cow, and satisfied them, and so long as cows produced a calf and supplied milk they seemed to answer; likewise in regard to the horse; many considered themselves fortunate to get a colt, and if it could stand on four feet and hobble along at a slow gait, they felt as though they were rising in the world. There are too many farmers of this class at the present day.

For many years the sheep were almost worthless, wandering about and leaving most of their wool on the bushes before shearing day came along.

At this day, however, not only in the Eastern and Middle States, but all through the West to the Pacific slope, nearly all the improved breeds of cattle, horses, sheep, and swine are quite numerous; sufficiently so to put them within the reach of the general farmer. Do the general farmers all through these Western States, and especially in Ohio, avail themselves of the advantages within their reach to secure pure male animals of the bovine race, and of the better kinds of sheep and swine, and also to breed to the improved horses which are so numerous? Many thousands of farmers are slow to make any improvement, but continue to use males of an inferior class and of the lowest grade, without stopping to think over the matter, and ask the question if it would not be profitable to pay an extra dollar for the use of a pure bred sire. It cannot be expected that a large majority of farmers would be able to procure thoroughbred females, but thoroughbred sires are within the reach of all, and by close attention and continuing to grade up by the use of these pure bred males of all classes of animals, very soon a high grade of stock would result, and the increased value of the farm stock in the States would be enormous. Let us examine more closely this matter, and see how well bred cattle, for example, will compare with scrubs, or generally what are called natives. Of this class of farm stock there are various breeds. I shall not attempt to say which of the breeds has a claim to the first position. That I will leave to those who use them, or intend to use them, in the great cattle industry of the State.

Cattle are classed as "beef breeds" and "dairy breeds." Of the former we will name the Shorthorns and Herefords. There are several other beef breeds, but few, if any, in Northern Ohio. If the farmer is stocking his farm principally with cattle, and only has a few cows to raise calves, and supply the family with milk, etc., and pastures cattle for beef purposes, we say either Shorthorns or Herefords will answer. By using pure bulls of these breeds to the low grade or common cows, a class of thrifty steers and heifers will be produced that will fatten readily at an early age, and make a rich carcass of beef. These young animals should be fed generously, but there is no need to fatten them the first year, so long as they are kept growing and in a healthy condition of flesh. At twenty four or twenty-six months old they will be ready for the butcher, and will, if they have been well fed, weigh from 1,200 to 1,400

pounds each, and the beef from these cattle will be of the best quality, and realize the highest price in the city markets, which is always from one to two cents per pound more than the beef from the poorly fattened common cattle. Many farmers avail themselves of this advantage to raise and fatten this improved kind of stock. Either of the above named breeds will answer for this purpose.

But many men still keep to the common sorts, and year after year keep on in the same old ruts, with the old kind of males and females, not seeming to make any improvement. Most of their cows are of the old sort. Even the noted "crumpled horn," with their narrow backs and straight ribs, of the coarsest kind from the nose to the tail-end, with bony and crooked legs and saddle-backs. These are to be seen on many farms in a day's ride through our own county. Many parties will purchase a low-priced bull, and if he has a white face, fancy they are breeding Herefords, and if of a mixed color, will tell you they are using a Shorthorn, when perhaps there is not one-thirty-second part of the blood running in the veins of these bulls descending from either of the above breeds. And what is the result? The offspring is a coarse, ill-thriving animal, of small growth, and, as a general thing, slow to mature. At thirty-six or forty months old they are turned off as beef animals, poorly fattened, coarse, and hard handlers, and the average weight from 900 to 1,100 pounds, and often less. These, compared with the improved animals, prove my point. Let us figure a little, and show more plainly the advantage of breeding up to higher grades. The steer of the higher grade at twenty-six months old, weighing 1,300 pounds, at six cents per pound, \$78. The common steer, weighing at thirty-eight months 1,000 pounds, at five cents per pound, \$50. Here we see that a year's feed, and care is more than thrown away. Even after allowing the extra year's feed, etc., to the common steer, there is left the difference of \$28. This should show all interested the absurdity of attempting to raise and fatten these common animals, when thoroughbred bulls of the Hereford or Shorthorn breeds are to be had at reasonable prices. The benefit does not rest with the steers alone. The cows when not needed for further use in the dairy, are readily fatted, and at less cost than the narrow-backed, flat sides of the old inferior sort.

In the "dairy breeds" of Ohio, and the West, a vast improvement would result from the use of pure sires, whether Jersey, Ayrshire or Holstein, which are strictly the dairy breeds. Many farmers of Ohio, and in Lorain county, are using a good grade of dairy cows, but still keep breeding to grade bulls, and very low grades at that. Consequently, there is no uniformity in their herds. The steer and heifer calves will show but little, if any improvement, the off-spring often going back to an ancestor of very mean quality as a milker or feeder. Such dairymen when selling their young stock to be fattened, realize but low and unremunerative prices. By using a pure bred sire, descended from the best milking families, a higher and more uniform grade of cows would be produced, such as would improve the profits of the dairy, whether in cheese-making or butter-making.

Some of the above named breeds are what is termed "general purpose" animals. Under this class is the Shorthorn and Ayrshire. Dairymen using bulls of either of these breeds would meet with ready sale for all their calves either at ten days old or four months. Any farmer pasturing cattle would jump at the chance to take such young stock.

Before leaving this part of my subject, I wish to urge upon all who are careless and indifferent with regard to the sires they use from year to year, to seriously think this matter over. All may not feel like purchasing a pure bull, but farms in Northern Ohio are mostly small, and so situated that several occu-

pants could unite and purchase a thoroughbred bull, to be used by each. The difference in price between four high grade steers, and four common steers, would more than purchase the young bull. Let all the \$15 be made into steers. It would be well if the managers of our county infirmity farm would discard their \$15 bull, and thus show to the farmers of the county the better plan of breeding a higher grade of cattle.

In selecting a bull be sure to have the individual quality and excellence, that is the individual should have a moderately thick skin, densely covered with long and soft hair—mellow to the touch, with straight back, ribs well sprung, broad loin and hips, quarters long, full and deep flank, fleshy thigh, deep and broad through the chest, rather a short tapering head set upon a moderately full neck. After you get thus far, see that the pedigree is right, and your herd will be vastly improved by the first cross, and soon, by continuing to reject all heifers that go back in quality to some scrub ancestor, the stock will not only be more uniform, but the increased value will be more satisfactory.

HORSES.

There are various breeds of farm or other horses. The time has passed for Bob, Dick and Harry to raise their colts for stud purposes. The better and pure breeds are plenty. Let farmers avail themselves of those most suitable for their purpose. Do not begrudge a reasonable fee for the use of a superior sire. If colts are raised and pastured for sale, those of the improved breeds will meet with ready customers. At four years old, when ready for work, if large and fine grown, they will sell quicker than small inferior ones. A really good "general purpose" horse will sell readily at \$175 to \$200, when a common horse used for that purpose will be hard to sell at \$100. And such is the case with all breeds—whether for farm purposes, for the road or for general purposes—it will pay to use sires of good breeding. The former, of the heavy Shire, Percheron or Clydesdale should not be used for raising horses to drive on the road, if intended to go faster than a walk. The business of such horses is heavy work at a slow gait. What is worse stock on a farm than a poor horse? It is always out of condition, and never worth \$75.

SHEEP.

For many years this class of farm stock has been improving. Thirty-five years ago but few good sheep were to be found in Northern Ohio. Most of the fine wool sheep were small and leggy, and cut but little wool, till our enterprising wool-growers invested in the improved Spanish Merino. Immediately their flocks increased in value, 50 to 75 per cent. in wool, and there was a good profit in the Merinos of this stamp, when those breeders who adhered to the old mixed up sheep made but little off their wool, and the sheep would not sell for mutton. At the present time a good flock of fine bred, fine wool sheep is good property, and even with wool at present prices, and the fleeces weighing eight or nine pounds each, will pay about as well as any farm stock. But a light wool kind, which cut from two to three pounds of wool per head, are the worst kind of sheep, and cannot be made profitable.

The mutton breeds have been generally improved. There is a vast difference in sheep raised for this purposes between the pure and high grades, and the old common kind. To continue to breed the latter is folly, yet many continue to use sires of the common sort, and wonder why their wethers, at two-and-a-half years old, will not make so good a price as their neighbors at eighteen months old. If these mutton breeds are mixed, resort should be had to

pure blood and rams of superior symmetry, feeding qualities, and also of good wool-producing sorts. Then often the cross-blooded sheep will be more profitable both in wool and mutton. Many of these breeds are heavy shearers, and the fleece and mutton of a good fat eighteen months' wether will make \$10, when sheep of the common kind will fetch less than half that price.

The various breeds of Downs (the black faces) cross well on the Cotswolds, Leicesters and Lincolns. The mutton of this class has more lean meat in proportion to the fat, and the curl taken out of the wool, which will make it sell for two cents per pound more. Fleeces are heavier, as the wool grows more dense.

SWINE.

Swine have been so greatly improved that no one need breed the old long-nosed narrow-backs and light-ham sorts. Heavier and fatter hogs go to market now at eleven to twelve months old, and make more money than those did fattened thirty years ago at two years old. Even in this class of farm stock many men are slow to make the improvement which can be so quickly done at very little cost. It will not pay to keep hungry, slab sided, ill thriving swine. By giving a large quantity of good feed, such hogs are never satisfied and they cannot be properly filled between their thick, hard hides and bones.

I think we may all be convinced of the importance and necessity of having better live farm stock. The old common cattle should disappear. The mixed up scrub sheep, the long snouted, sharp-backed swine, and the almost worthless horse should also disappear. This must be done to compete successfully with the large stock-growing companies of the West who are largely improving their herds and flocks. Let all farmers feed generously, and see that the feed given produces a good return from the animal that consumes it.

I will close these remarks by quoting a few lines of a poem, read by Dr. L. B. Walker, before the Richland County Agricultural Society in 1855. The whole poem is excellent—applicable to every department of the farm and household.

"Have a plan about your farm, your crops, your hogs, your cattle.
Work is not all; to calculate is fully half the battle.
Speaking of cattle—get good breeds; they'll pay you for their keeping,
Bad breeds will eat their heads off twice, and then not be done eating.
Some farmers' hogs are head and ears; for feed the corn is taken,
They turn it into skin and bones, and then they lose their bacon.
Some folks keep sheep, and the more they're fed the less the wool increases,
Then scold about the price they get for coarse and scanty fleeces.
Don't buy sorrel horses with white feet, nor cows with a bull's head;
Nor think the extra breeds will keep unless they're extra fed.
Some starve their cows in winter time; in spring they starve the calf,
Then wonder that their stock's so poor, 'twould make a donkey laugh.
Give your stock shelter and a bed; keep young calves with their dam,
And if you do not change your flock, be sure you change your ram."

THE COBDEN CLUB, AND ITS WORK IN THIS COUNTRY.

BY JOHN POW, SALEM, OHIO.

[Read before the Ohio Wool Growers' Association, and at one or two institutes in the "wool counties."

This subject is one in which you are all deeply interested, because its work is directed against our system of protection, and consequently against your industry. Tariff duties and their relation to wool growing, and other industries, in this country, have been very thoroughly exemplified by the reductions of 1883, as shown by the general prostration of the business interests of the country, and the same have been quite generally discussed by the press, and also by our political economists. It is not, therefore, my intention, in this paper, to speak of tariff duties except when I may do so in discussing the subject for consideration, which in my judgment has had more to do than anything else in developing and fostering a sentiment in this country of which the tariff reductions of 1883, and the still further reductions contemplated, are but the legitimate sequel and outgrowth.

I refer to the work of the Cobden Club in many of our institutions of learning, backed by English capitalists for the dissemination of free trade literature, with the avowed hope and intention of reaping a benefit from it not controlling our markets for English products, and breaking down our industries, thereby displacing the labor connected therewith, and forcing the same into agricultural pursuits, the products of which are already greatly in excess of the actual consumption by American citizens.

The magnitude of the power and influence of the Cobden Club can be probably best understood when we contemplate the fact that annually at least \$50,000 is appropriated and expended in the furthering of free trade sentiment. It is stated, on reliable authority, that at least 700,000 copies of pamphlets and documents have been distributed among our people, with the view of breaking down the American protective system. These influences are backed and sustained by the capitalists, manufacturers and statesmen of England. It is said that 219 members of Parliament and almost the entire English cabinet are members of the Cobden Club. Added to this are their agents and confederates, who are engaged in the importation of products. Besides there are with them the professors of many colleges in the United States, who boast that every student they turn out is in favor of free trade; and through the Cobden Club, silver medals are awarded students who write essays upon the subject of free trade in Harvard, Yale and Williams colleges. Gentlemen, that through these vast influences some progress has been made toward the breaking down of our protective system, and the crippling of our industries, is not surprising. And yet why an American citizen, and especially a producer, is willing to be duped by the sophistry advanced by free trade economists, backed by English capital, is a mystery, and yet not more so than that an American producer should not prefer his own markets for his own products.

I have spoken of what the Cobden Club is doing to break down our protective system, in behalf of England. Now the question is, Why should England put forth such efforts as referred to, to break down our protective system, and introduce her own system of free trade in its place? It is certainly not through love for the American people. I believe a good reason can be offered. It is because England does not raise sufficient food to feed her own people. In the year 1883, England paid out for breadstuffs, meats and other articles of

food consumed, over \$600,000,000, and if the increased ratio should be the same for the next ten years as for the past, it will require over \$1,000,000,000 in 1893 to furnish sufficient food to feed her people, beyond her own productions. No nation can stand this great drain of wealth for any length of time, and no people better understand this than the English; and the question with her manufacturers, statesmen and politicians is how to provide cheap food for their people. If she can break down our protective system, she has good reason to believe that our laboring men employed in manufacturing would of necessity be driven into agricultural pursuits, and that would result in a very large over-production, which would put down prices, very probably, to one-half of what they now are. Farmers would then receive fifty cents for what they now receive one dollar for—and I ask you farmers who are present, Who would be benefited thereby? You could not raise one bushel more per acre than you now do, and yet you would only get one-half the price. England would be benefited. She would then buy her food products for one-half she now pays, and the farmers of this country would be the losers by just what England would gain.

That is not all. England wants a market for her manufactured products, and if she can cripple or break down our manufacturers, she expects we will buy from her what we now produce, and in that way add to her prosperity and wealth, and our poverty, which undoubtedly would be the case if we, as a nation, should adopt her free trade policy. There can be but one result if this nation adopts free trade, and that will be to reduce the price of labor to the basis of cost of pauper labor in Europe. More than \$7,000,000,000 worth of goods are annually produced by the manufacturers of this country, and over \$1,500,000,000 is paid for labor to produce them. Of this large sum of money quite a considerable part is expended in the purchase of your products, such as wool, meats, and breadstuffs; and indeed, it is in this way that the business of the country is made, as well as the prosperity. Do any of you believe that it would be for the best interests of American citizens, or an economic measure, for this government to adopt a policy which would take away one half the means of subsistence from laborers, and compel consumers to buy in foreign markets (which the consumer always must do in effect when he buys an imported article), by paying the cost of transportation in the purchase price, and thus take permanently from the pockets of American citizens \$7,000,000,000 annually, which constitutes a part of this Nation's wealth.

It is said by free traders that a benefit would accrue to this nation and people by the adoption of free trade, growing out of reciprocity of trade. Now, what is reciprocity of trade? It is simply this and nothing more: You buy of me and I will buy of you, provided, you sell as cheap as I can buy elsewhere. Gentlemen, what would you think of a man desiring to purchase any commodity who would first seek to learn how the balance of trade stood between nations, as one of the factors necessary to know in making the purchase? Suppose that a man in this Convention desired to purchase one thousand tons of steel rails. Would he consult the balance of trade between England and America in making the purchase? By no means. He would telegraph New York and London to learn the prices, and then purchase where the price was the lowest. It is a matter of business, and he buys where he can make the most money. He would not care to know how the balance of trade stood between nations. There is nothing in the doctrine of reciprocity as preached by the apostles of the Cobden Club. No, every step taken by this Government for the reduction of tariff duties below an amount which will secure to the various industries prosperity is one step toward the extinguishment of the industries and against the laborers of this country.

As proof of this, I quote from an address written by Mr. Mongredien, who is employed by the Cobden Club to write addresses to American farmers, in the interests of England. He says: "Let the American farmers give their support to no candidate for a seat in the House of Representatives who does not pledge himself, if elected, to vote for a reduction of at least five per cent. every successive year on the import duties, until the whole are abolished." So you will see, my friends, that the capitalists of England, through the Cobden Club, have the cheek to take part in our elections, by making direct appeals to our people. I ask you, fellow-citizens of Ohio—farmers, sheep-breeders, and wool growers, without regard to political affiliations (which, from observation, must be very strong), whether you are willing to vote for a candidate for the House of Representatives who is in full sympathy with the Cobden Club, on the subject of free trade, and who will, if elected, attempt to carry out the instructions of the Mongredien address to American farmers? The hope of the prosperity of all American citizens lies in a protective tariff sufficient to give the American market to home products.

The cry against surplus revenue arising from protective duties, and the reductions proposed as a remedy by some of our Congressmen at this time, shows, in my judgment, very great stupidity, and is probably best refuted by the fact that lower rates of duties have given increased revenues. This result could not but follow, from the fact that low rates of duties open up our markets to additional importations of products. In connection with this, I will submit some facts which are very significant. The surplus revenues for the year 1885 were \$17,859,735, and the estimated shortage or deficits, necessary to meet the current expenses of the Government for the year ending June 30, 1887, is \$25,000,000. With this statement of facts, why talk about reduction of duties, with the view of reducing the revenues? Should the results sought for be brought about by a reduction of duties, would it not necessitate direct taxation to meet the deficit of \$25,000,000?

The theory advanced by some of our New England manufacturers that they should have free raw material is simply, if recognized and adopted by this Government in a law, one step taken toward free trade. As illustration of this proposition, I submit: First, compare the wool-growing industry of this country, whose product is spoken of by the woolen manufacturers as raw material, with the woolen manufacturing industry. The census reports give 1,020,000 flock masters, with at least 2,000,000 attendants; in all over 3,000,000 persons engaged in and dependent upon the industry, with at least \$5,000,000 of capital invested. The woolen manufacturing industry is represented in numbers, employers, and employes, at only about 120,000 persons all told, with a capital of less than \$300,000,000. I ask you, gentlemen, is the product of woolen manufactures, only three-fifths of the capital represented by the wool growing industry, represented by a capital of \$3,000,000, with the 180,000 employes only six per cent. of those engaged in wool-growing. any more deserving of the protection of this Government than the 300,000,000 men engaged in the wool industry, with a capital of \$500,000,000? The illustration or comparison here given of wool and woollens will apply to almost any industry, and any legislation in this country recognizing the claims as set forth by the manufacturers, for what they term free raw material, would be, in my judgment, class legislation. No greater mistake can be made by the manufacturers of this country than to show a desire to build themselves up by sacrificing other industries. It means, if successful, the alienation of all producers of what may be termed raw material against the manufacturers, and will drive them into the ranks of free traders.

The theory advanced by some of our would-be political economists that all tariff duties are but a tax upon the consumers seems to me erroneous. Who knows for a certainty who pays the duty? foreign producers or importers, who declare that the duty they have to pay before they can sell in our markets, comes off of them, and that their profits are less the duty, or the political economist referred to? There are two systems of political economy. One is based on theory and assumption; the other on established facts, such as that general prosperity to the people of the United States has always followed a protective revenue tariff.

What, then, is the duty of the hour, and how shall we, as sheep-breeders, wool growers, and producers generally, be able to successfully combat this dangerous and fallacious enemy, free trade, whose doctrines are being spread all over this country, through the Cobden Club? This is the question of the day. I know of no way by which it can be done more thoroughly than by meeting the doctrine with literature, based on protection to all those engaged in industries and the laborers of the country. Let a committee be formed from those engaged in industries needing protection, with power to raise funds necessary to secure the best of ability to write addresses and secure their publication and circulation (most agricultural papers would gladly publish the addresses), and in this way educate the people as to what constitutes true political economy to American citizens. One of the greatest impediments to tariff legislation has been a selfishness growing out of distinct and separate interests, thus prompting industries to act separate and apart in securing favorable legislation. No legislation in this country should meet the approbation of the people unless the greater number are to be benefited by it, and no legislation secured by selfish motives is at all likely to benefit the masses. In securing legislation all industries standing in need of protection should work in harmony, and the results should be equitable to all. Tariff legislation thus secured would have a permanency, because its effects would be mutually felt by all industries and citizens, and would have no elements within itself for its own destruction. And thus the business interests of the country would not be liable to sudden convulsions arising from the changes of values in products incident to frequent tariff legislation.

Gentlemen, in conclusion, I cannot but recommend that some action be taken on your part to counteract the influence of English capital, as used through the Cobden Club, and certain American institutions of learning, to break down the American system of protection.

EXPERIENCE IN THE SOILING SYSTEM OF FARMING.

BY C. Z. YODER.

[Read at the Wayne County Institute, Shreve, Ohio.]

I shall not attempt to teach you everything that can be learned on this mode of farming; nor do I appear before you as an eloquent speaker, possessing good literary talents, nor as a glib tongued agent who is selling the most wonderful invention of the age, or the famous Bohemian oats, or Red Line wheat; nor are we here to give you the experience of a New England farmer, or of some Lord of England or Germany, but from a sense of duty I am prompted to give you my own experience.

We well remember how eager we were to hear every word spoken, and to read every line that was printed upon that subject when about to undertake soiling; nor did we get much encouragement from our neighbor farmers. They thought it would be good for our land, but it would be too expensive and too much trouble, and to save gossiping about it we did not intimate to any of our neighbors that we contemplated adopting this system until we were ready to "try it on."

When we were preparing the ground for our first soiling crop, our hired hand was asked by a good old-fashioned neighbor farmer what I was doing; the hired man told him. "Well," says the neighbor, "one year will do him;" other farmers gave me a little more time, but said I would soon become tired of it. It is now eleven years since I adopted this system of farming, and it has proved itself more satisfactory to me than I had anticipated, nor have I to day any thoughts of abandoning it on my farm.

And yet farmers generally have been slow to adopt this way of farming, and I believe will be for several years to come; from this fact, that the farms are fenced off into fields, and, as a rule, farmers have become so accustomed to pasturing and to the fences, that they fail to see the inconvenience and expense of these fences, as well as the annual loss sustained, by wasting manure, land, etc., but look at the feeding of cattle to be much more laborious and burdensome than it is.

In 1869 I bought the farm which I now reside upon, situated two miles south of Smithville, and began farming then and there. Prior to that time the farm had been leased for many years, and by too much pasturing, careless farming, and applying but comparatively little manure on the land, the farm had become impoverished, and the buildings and fences were badly dilapidated.

In 1873 we built a good barn, and had the stables and feeding room arranged so we thought it would be convenient for adopting the proposed system of farming, which we began the following summer of 1874. Our following calculations are based upon the farming of grain-producing farms of Ohio:

Land that is too wet or hilly and rough to cultivate with profit, we would, of course, think it best to pasture.

By the soiling system, we mean to feed the cattle in their stables with green feed, cut and hauled into the barn for that purpose, instead of pasturing them as is customary in our country.

We will now consider some of the advantages that we have in this method of farming over that of the old way by pasturing and fencing.

First, we save land; second, we make and save more money; third, we save fencing; fourth, we save much tramping of the soil; fifth, it is more convenient; sixth, we save labor in cutting thistles, briars, elders, running after breechy cattle, etc.

First—Saving land. The number of acres requisite to keep a certain number of cattle by soiling depends very much upon the quality of the soil, etc.; but from our experience we can keep six or eight head of cattle from three acres as well as we can keep them on ten acres, by pasturing them, and a difference of seven acres in soiling.

Then, again, when we pastured, we had our farm of one hundred acres divided into ten fields of nearly ten acres each, with a lane fenced on both sides running through the middle of the farm; hence, we had about 720 rods of interior fences, which were built mostly of rails; and the lanes had to be twice as wide as they now are without fences, because of hauling in wheat, hay, or fodder, and in order that teams may conveniently pass each other, in hauling grain or manure with two wagons; thus, we save about four acres more land by having no interior fences, which will add up eleven acres of land saved

on our farm by this system, which is worthy of consideration, when our land sells for about one hundred dollars per acre.

Second—In making and saving manure, it is very evident that we have a decided advantage in this mode of farming. Because, first, we have eleven acres more land to raise feed and straw than we had when we pastured, which is all converted into manure. Second—the three acres which we use to raise feed for our cattle also go to increase the quantity of manure.

Third—About everything that is not hauled to the barn for feed and for bedding for our stock, is plowed down as green manure. Clover especially is considered valuable for renovating our worn-out soils by plowing it down, which, by the way, is seldom done in pasturing, as it is nearly always wanted for pasture, but in soiling we plow down the second crop of clover, or we may leave it for seed or aftermath, which, too, will be worked through the stables into manure. We aim to convert everything into manure that grows on our farm except wheat, meat, butter, eggs, grass seeds, and fruits and vegetables for our family. In planting, stale and droppings are waisted in the lanes, fence corners, ditches, and timber lots, even in the pasture fields we do not receive much benefit therefrom, as the droppings lie exposed to the weather for months and impede vegetation. Manure makes manure; the more manure we make and save, and then judiciously apply to our land, the more feed and straw we can raise, which again are essential to making manure. We make about three times as much manure now as we did when we pastured, which is due mostly to this mode of farming, either directly or indirectly; directly, because we have at least eleven acres more land to produce material for making manure, and because we save all the manure that is made on the farm; and indirectly so, because of the increased fertility of our soil, we can raise better crops of wheat, corn and hay, which in due time enlarge the manure pile.

As regards the saving of fences, we can at least dispense with all interior fences, excepting our yard fences, and were it not for charity's sake, we could also dispense with our outside fences. However, as we have said above, we have saved over 700 rods of fence on our farm, which has been estimated to cost from 75 cents to \$1.00 per rod for labor, material, etc., and if this were all, the fence-maker indeed would be fortunate, for just as soon as the fence is built, it is liable to be blown over by a storm, or burned down, or up-set by breechy cattle, or "hallow e'en-ers." We have seen that farmers were compelled to quit work in the harvest field to go and repair the fences, in order to prevent their cattle intruding upon their neighbors' or their own grain fields. Our fences in our county alone cost us thousands of dollars, and on the majority of the farms are by far the most unsightly thing on the farm, grown up with briars and weeds, affording protection for dangerous and injurious reptiles; they annually require more labor and money to repair them than they are worth. Why, just think of keeping up such an expensive thing twelve months in a year, so as to have the use of them for five months in a year. The best that can be made of them, they are only a temporary, inconvenient, and in short an unprofitable thing.

Fourth—The tramping of our land especially on our clay soil in pasturing at all times during the summer season is far more injurious to our land than most farmers seem to think. However, any enterprising farmer will readily perceive a vast difference in plowing and pulverizing two fields, one of which was pastured, and the other one mown for hay. The field that was mown is not only easier to plow, but also much easier to pulverize, and to bring it in a good condition to sow or plant our seeds with much less labor and expense for one or two years. Not only will the tramping of the fields cause the land to be stubborn to break up and pulverize, thereby making its chances less for

a full crop of anything, but the tramping of a field while pasturing it will more or less injure the grass, retard its growth, and consequently will produce less feed, and the result will be less manure and less gain for the farmer.

Fifth—Convenience on a farm is well worth the consideration of every industrious and economical farmer, the more convenient we have our farms and buildings, the more labor and money we can save, and it certainly affords us much more pleasure and satisfaction to cultivate such a farm than to be encumbered with fences, bars and gates. Having no gates or bars to open in going to or from the barn and fields, or hungry cattle or hogs running after you and trespassing wherever there is any change of pushing a gate open, it is much less trouble to drive home to the implement house with our plows, cultivators, drills, self-binders, etc., and store them away in the dry when night comes or a rain overtakes us. We all know that farming utensils, when kept in the dry will last longer and do much better work than when they are frequently exposed to wet weather. Plows, if put in the dry when not in use will then be ready to do good work any time while if they are left out in the wet and mud, it will take some time and much patience to get them in order again to do good work, and so it is with all farming implements. How inconvenient and perplexing it is to move a self-binder through a narrow lane and narrow bars and gates every farmer knows that has used them. Again, it is convenient in having no fences, we can drive onto our farm road that leads to the barn any place along one whole side of the field, instead of always driving to one corner of the field where the gap is to get out or in, in hauling in grain or hay, or hauling out manure, and so on. Much tramping of the ground is also saved by not driving over one place continuously as we have to do when we have fences all around the field. How much more convenient it is to have large fields to plow and cultivate, or harvest, than it is to work in small fields, as they generally are when they are fenced off for pasturing, and often we see them in an irregular shape which makes it still more inconvenient. Think of the large corn fields, how much corn is saved by not having to turn so often, and where there are no fences we can oftentimes drive out onto the farm road or on to the grass to turn around, thereby saving the corn.

Sixth—If there was any thing which was dreaded on the farm in our boyhood, it was being sent out into a large pasture field to pull of the nasty thistles, to grub them out or to mow them with a heavy briar scythe, yet it had to be done, they were an unsightly thing to my father, and no thistles were allowed to go to seed on the farm. But the farmers did not all feel so disposed to destroy the thistles, and unless this work would be done by all, there would always be seed enough to pollute the land every year. So that we had to go over the pasture fields, and along the fences every year to cut the thistles, briars, and elder bushes, which we do not need to dread so now.

Another advantage we have is that our cattle do not become breechy, and we are saved the trouble and vexation of spirit in running after breechy cattle for hours, and sometimes even days are lost in hunting stock when they get away. We have been offered such cattle at reduced prices, because they were a nuisance to let run with other cattle while pasturing them.

In our remarks above we certainly have not over-estimated the expense and inconvenience of the fences as well as the waste of manure, etc. For instance, when we travel over the county, we see that the majority of farms are fenced into fields of less than ten acres each, upon which we based our calculations, but we will calculate that there are eleven acres of land lost for every hundred acres of land we have in our county. Now, as the whole surface of our county contains 342,805 acres, and we will suppose that only two-thirds of it

is arable land, we will find that we have 25,135 acres of land wasted by pasturing, in our county.

There was a time when the early settlers had a profit in fencing, when land was worth only a few dollars per acre, and timber was of no value to them, and when one-half or three-fourths of the land was yet forest where the cattle would be pastured, and it was only necessary to fence in their grain-fields. Nor did they have the means or opportunity to build themselves large and convenient barns and stables; neither did they have the drills, cultivators, mowers and reapers to take care of as we have now, but their sickles, mowing scythes and hand hoes they carried home on their backs, and stored them away under their house roof. Their land was fertile and manure was but of little account. But how amazingly things have changed; our land sells from \$50.00 to \$150.00 per acre instead of from \$2.00 to \$10.00 per acre, our timber land has become valuable, and the scarcity of it to-day clearly indicates that our forests demand protection, and that no lumber should be used excepting for necessary and profitable improvements.

Now we have large and commodious barns to feed our stock in the stables. Both barns and fences are expensive, and if we can dispense with one, so much will be saved to invest in something more profitable. Now the deterioration of our soils demands a careful saving of our manure. Think of the thousands of dollars that are annually paid in our county for commercial fertilizers, and yet hundreds of tons of good manure are annually wasted.

These few remarks will suffice, as I think it is evident that in our age of improvement it becomes necessary that we, as farmers, adopt a more economical way of farming. I will now give you our method of feeding, the kind of food I raise, etc., during the soiling season.

One of the important things in raising crops for soiling is to have the land on which you raise the soiling crop rich and in good order, so that good heavy crops can be raised therefrom, as it takes much less time and labor to gather the rations from a good piece of fodder than from a poor piece. A second thing of importance is to have this land near the barn, and a third is to have a convenient stable and feeding room, and implements to convey the feed to the barn.

We depend upon green rye, clover, and green corn fodder and roots for our soiling crops.

During the month of September we sow the rye, about one and one-half bushels per acre. For early feed, in the spring, when it is taken as soon as it is tall enough to mow conveniently, it makes good feed for milk cows, and when the weather is favorable and the soil is fertile the second crop of the early cut rye can be cut again, when ripe, for tying corn fodder. But after the rye is all out in heads, the cattle will not relish it, and by the time it will blossom they will refuse to eat it. But by this time the clover will be ready to mow for feed, which I use for feeding until wheat harvest, when the first crop of fodder corn will be ready to mow. I manage to have corn to feed until frost kills it, which ends the soiling crops, unless we have roots.

Green fodder corn is the best feed for milk cows that I have tried yet, but after it is all in tassel it is not so palatable. Cows that are fed on young green corn-fodder during the months of July and August will generally do better than the cows that are in pasture when it is so often hot and dry and the flies are bad.

In order to have young and palatable corn-fodder from harvest until autumn, one must sow corn at least three different times in the season. First, I sow about corn planting time. To sow much earlier, the seed will be liable to rot. Second, I sow about the first of June, and the third crop I sow just before hay harvest, or about the twentieth of June.

In seasons that are not very dry, about the latter part of July, it would be well to sow the fourth time, but if it is very dry, the corn may not come up in time to do much good before frost comes.

The amount of land needed to raise a sufficient quantity of feed, will depend very much upon the condition of the soil, and also upon the season; but it is advisable to sow plenty, and if some rye or corn is left it will in nowise be lost, but can be cured for winter feed.

To keep six or eight head of cattle, I sow about one-fourth acre to rye, one and one-half acres to corn. The clover which I need for soiling I mow in the clover field, which I have for hay.

The corn I sow with a good grain drill, just as I would sow oats or wheat, about two and a half or three bushels of good seed per acre. The ground should be in good order, having a mellow surface so that the corn will be covered nicely. If it should rain hard and then get dry, so as to form a crust before the corn comes up, I harrow the ground well with a common drag by the time the corn comes up. This is all I do to corn, and generally make a large amount of feed per acre.

The lots on which the rye and the first crop of corn were raised can be sown to turnips and the lot on which the second crop of corn was raised, can be sown to rye for the next season.

I once tried oats for a soiling crop, but the season was dry and the crop remained short, and by the time it was fit to cut, the corn was ready too, and was better, so I had no advantage in sowing oats for soiling; but for all I know the greatly renowned Bohemian oats might be excellent.

After the frost kills the corn we must have roots, or root tops, or pumpkins to feed if we want the cows to do well, and keep up the flow of milk. In addition to the green feed, I generally feed some bran to the cows. Since, by soiling, all the manure is saved, one can afford to feed bran to cows, especially if we value the manure from feeding bran as highly as some of our scientific farmers do, who estimate the manure from feeding bran as high as we generally have to pay for bran.

As to the roots, I have cultivated turnips, rutabagas, and the mangel-wurzel, which are all very good. The seed for these roots with directions for cultivation can be had in any good seed store, or provision store. The tops of these roots will make good feed for the cows after the corn is frosted, and the roots, if a sufficient quantity are raised, are very good to feed in winter and spring, before we can have rye to feed.

The most convenient thing that we have yet seen to haul the green feed with is a cart that I had made for this purpose. On this one-horse cart can be loaded feed enough to do six head of cattle one whole day. The feed is mowed in the morning with a mowing scythe, and hauled in to the second floor of the bank barn, where we can dump the feed down the chute into the feeding-room, where it is convenient to feed. By hauling in the feed in the morning, when it is moist and cool, it will then remain so all day. On Saturday, I haul in two loads of feed to last over Sunday.

In adopting this system, one should see to have a convenient stable and feeding room. I prefer having a floor in the feeding-room within about two feet of the top of the manger, as this makes it easy to feed, and to keep clean the feeding-room. My mangers are so that two cows can eat together out of one manger, with single stalls. In this way two cows can be fed about as soon as one could be fed singly.

By having everything in its place and convenient, I can haul in our feed, and tend six or seven head of cattle in the morning, and be ready to go out into the field to work with the hired hand, who during that time had four or five horses to groom, feed and harness. The horses I have always fed on dry

feed with good results. At noon, and in the evening, I would also attend the cows, while the hired hand would attend to the horses.

It is well to feed at regular times, which can easily be done in the morning, at noon, and in the evening, not too much at a time. I feed some before and after breakfast, also twice at noon and in the evening, which may appear to make much work, but when everything is convenient, it will take but a very few minutes.

Cleanliness is essential in keeping stock in the stables. It is well to at least sweep down the dirt with the cob-webs every summer once, and white wash the stables.

I soon learned the necessity of having a good floor in the stable, with a gutter just behind the cows to carry off the liquid manure, as in feeding green feed there will be much liquid manure, and one cannot have litter enough to absorb it all, so that when cattle are standing on the ground, stamping more or less on account of the flies, they will soon have holes where the liquid manure will gather, which will make it filthy and unpleasant. We formerly had a plank floor, but it was not quite satisfactory, as the cattle would slip and sometimes fall, and rats would harbor under it. I now use a cemented floor, and like it much better for the above reasons. To make a good floor, the stable should be filled up with stone, hammered tolerably fine, four or five inches deep. A thin cement is then made, with good water lime one part, and two parts sand, spreading it over the stone so that it will fill up the crevices. Lastly, make a thicker mortar for a top coat. This should then be left to settle about two weeks before cattle are allowed to run over it. The stable is cleaned in the morning, at noon, and in the evening. By having the fork and wheel-barrow in their places, this can soon be done.

The cows are let out into the barn-yard, where there is running water, in the morning for about half an hour, and again in the evening about five, when they are left out perhaps an hour. Feed is always put in the feed troughs and mangers before they are let into the stables. In this way the cattle can easily be taught to come in at once when the door is opened for them, and each one will take her place. When I began soiling the cattle, I had proposed to fence off a lot so that the cattle could be let in at night, so that they could have some exercise, but I am convinced that this is unnecessary. My cows are just as healthy as they were when they were compelled to walk after their food, and be so much annoyed with the flies.

The stables should be well ventilated, especially at night. When the flies are numerous, I darken the stables in day-time by hanging shades on the windows, when the flies will not disturb them. By treating the cows kindly they will soon become tame and docile, which is certainly very desirable.

I am often asked whether the cows will do as well under this process as they do when they are pastured. Of course, this will depend entirely upon the care and feed that they get. If they are cared for as I have remarked above, and the food is cut and fed when young and tender, I believe that they will do as well on the average. Sometimes when there is a wet and good growing season then the cows in pasture may do a little better, but when the weather is dry and hot, and flies pester the cows, they will do better to feed them in the stable. But very much depends upon mowing the soiling crops when young, as they will then produce more milk than when the food has nearly attained its full growth, excepting clover, which I think is just as good when it is in full bloom as when younger.

However, as dairying is only a secondary object with me, I do not mow the food as young as I should to obtain the highest profits from my cows, for the

simple reason that it takes more labor to gather the food when it is small than when it is large.

My principal object was to bring the farm to a higher and more profitable state of cultivation, so that better crops of wheat, corn and clover could be produced, so as to grow three blades of grass where but one grew before.

Considering the price of dairy products, I deem it more profitable to keep a less number of cows on the farm, and feed more fattening cattle during the winter season, as I have had more profit so far by fattening good cattle than keeping cows, either by pasturing or by soiling them.

One thing should be remembered in keeping cattle in the stable during the day, and that is not to let them out when the sun is very hot during the hottest part of the day, as they will be in danger of sunstroke. However, this can easily be avoided by leaving them out in the morning and evening in summertime before nine and after four o'clock.

Another thing I wish to notice is that by not pasturing the young clover after harvest, which has been sown the preceding spring, the clover in a good growing season on a fertile soil will grow so large that there will be danger of its being smothered under a heavy snow, according to the condition of the soil when the snow will fall.

However, this can be very satisfactorily and profitably remedied by mowing down the clover, with the weeds, which are so likely to grow up in the stubble field after harvest. If the season is wet, this should not be delayed later than the latter part of August, when a heavy coat of weeds and clover can be left on the field, where it will soon wilt, and the young clover will sprout and grow up through this mulch, and we will have a better crop of grass to cut the next season and of better quality, as the weeds, stubbles, etc., will have decayed, so that they will not be raked up with the hay. Another objection may be had from the fact that the butter will not have as desirable a color as when the cows pasture on blue grass, and other natural grass when it is young and tender.

I do not doubt but that there may be other vegetables or roots raised that might be fed in addition to the soiling crops which I have used, and that might produce a more desirable color in the butter. There are other trivial objections brought forth by some, but they would be easily overcome by perseverance. For instance, the principal objection that most farmers have to soiling the cattle is that it makes too much work. But I would rather mow and gather and haul the food to the barn, and feed and keep the cows clean, etc., than to build and repair the fences, bars or gates, cut down the briars and thistles in the pasture fields and fence corners, and drive the cows to and from the barn, as we have to do when we pasture, that is, only considering the labor, and saying nothing about convenience, attainment of manure, etc. As to raising calves, they do better for me in the stable than they do out doors.

In conclusion, I will give you some figures as to the difference in the amount of wheat and feed that I now raise, and at the time when I pastured my stock.

For five years before I adopted the soiling system, I raised on an average 273 bushels of wheat per year. Since I adopted this method of farming, I have raised on an average 770 bushels of wheat per annum.

On the average, I keep now about as many horses, cows, young cattle, sheep and hogs as I did when I pastured. But in those five years I only fattened two steers for the market off the feed raised, more than what the above-named stock required for maintenance. But since then I have fattened on an average sixteen head of cattle for the market every year that have weighed on an average 1,300 pounds. However, I had one almost entire failure of a corn crop. In the year 1883, when we had very early frost in autumn that almost

ruined our corn crop. I fed but eleven head of steers that following winter, and had to buy most of the corn. Besides this, I perhaps bought 100 bushels of corn altogether, the balance of the feed was produced on the farm for fattening 182 steers since I adopted this system. But I can not attribute all of this difference in wheat and feed raised on the farm to this system of farming for these reasons:

First—I have underdrained several acres of land which will produce better now, although this land was used for pasture.

Second—I have cleared ten acres of timber land on the farm since I quit pasturing, although that also afforded some pasture before it was cleared.

Third.—I have since bought ten acres more cleared land, so that I now have 110 acres of clear land, while I had but 90 acres besides the timber before.

I, however, have good reason to claim that there is a greater difference in the condition of the farm than the above figures would indicate; that is, if I should be equally blest with good seasons, etc., for the same number of years in the future, I might expect better results, because of the land being in a better condition than it was.

HOW TO MAKE THE FARM PAY.

BY P. MANCHESTER, ROUNDHEAD, OHIO.

[Read at the Auglaize County Institute, Wapakoneta.]

The object of this essay is to point out methods to cheapen productions, and the necessary means to insure remunerative prices. Farm profits are mostly prospective, in the growing crops and domestic animals fed therefrom. The way to obtain the best results from the least expense is the object of all producers. Experience, intelligence, and skill, directed by careful consideration, is necessary for this purpose, especially for the farmer who has so wide and varied a field of production. The soil is the main source of his wealth, and should, first of all, receive his especial attention, since, in proportion to its productiveness, will he reap benefits.

All clay soils, for successful cultivation, more or less need drainage, and for much of our wet, level land it is indispensable. On the thoroughness of this work, depends the permanency of the success.

Main open ditches, with ample outlets, are the first steps to be taken in very level land, into which the surface water, by minor drains, dug or plowed, can be turned. But these open ditches are too wasteful and expensive to be long retained. They need frequent repairs, occupy the best and most fertile portions of our fields. Through these open drains the richer and finer portions of the soil are washed away. They make point and turning rows necessary, a great inconvenience of handling machinery, and are a fruitful source of weeds, which it costs more to subdue in these waste places than to cultivate a crop over them, if tiled; hence, there is a profitable necessity of tiling them, so far as practicable. In many instances, on my own swampy farm, the entire expense of tiling has been paid from the increased value of the first year's crop.

None but faithful and competent men should be entrusted with this work, and usually under the owner's eye, so that we may have the assurance that no depressions are left to fill with silt, to render the work useless. The permanency and usefulness of tiling depends on the material used and character of the work done.

Tile, after being distributed along the ditch lines, under favorable circumstances, can, with the use of machinery by competent men, be put in the ground and covered for six cents a rod, in stoneless, deep, black soil. Tiled land can be available for crops to the depth drained. Tiling land improves the texture and quality of the soil, rendering it impervious to the air, imparting fertilizing elements. Tiled land can be plowed sooner in spring, and with less delay in cultivating crops after rains. Tile drainage makes the soil warm up sooner by the spring rains passing down through it; prevents crops freezing out in winter; enables us to get more benefits from manures; it improves the quality and increases the quantity of hay and pastures; prevents surface washing, and makes the soil pliable and mellow for cultivation; removes stagnant waters from the surface, and surplus water from under it; banishes chills with fever, and other malarious diseases; it increases the quantity and improves the quality of grain; it lessens the baking of the soil by evaporation; it prevents rust in wheat, and rot in potatoes; makes the soil dry in wet weather, and sufficiently moist in dry weather. By drainage rich stores of plant food, which have been accumulating for ages, are made available. These are but few of the advantages of tiling that might be adduced and verified. I have never seen a season too dry and warm for a crop of corn on a loose, humus, drained soil. Every acre of ground should be made available with our surplus capital by deepening its soil, rather than by extending the surface area.

No practical farmer can afford to leave stones, stumps, and rubbish on a field intended for general cultivation. They cause a loss in the use of ground and breakage of machinery, when time is most valuable.

In cultivating large fields and farms, the following remarks will apply:

The proportion as one man can do more and better work with three horses than with two, in that proportion is it better to plow and harrow with three-horse teams, having plows and harness suitable?

Careful attention should be given to the kind of implements used, and its adaptability to the different soils to be cultivated.

A three-horse sulky plow is desirable, that will turn a square corner either way without being lifted out of the ground.

Large and well saved manure piles, aided by Kemp's spreader, are valuable auxiliaries for farm products, and deserve better attention.

Every day's plowing, where a crop is to immediately follow, should be harrowed or pulverized the day it is plowed. The neglect of this work is quite too common for the best results obtainable.

This harrowing of freshly plowed ground, serves to retain moisture for plant growth.

Thirty acres of clear ground can easily be harrowed with a four fold, three-horse Thomas harrow in one day. Some think this harrow does not "catch on" enough. Such can hitch to the other end, and it will catch on to as much rubbish as any square tooth, horse killer ever made.

The Acme harrow is unsurpassed by any harrow for sod ground without disturbing the inverted sod.

Thousands of dollars are annually lost to farmers for want of proper and timely care in saving and drying seed corn before the frosts of winter ruin it. Still, the necessary precaution of testing before planting should never be neglected. The delay of replanting, or planting more seed than necessary, often materially diminishes the crop.

To secure quick germination and speedy planting, a two-horse planter, with wire checkrower is desirable. And the sooner a phosphate attachment is perfected, so that some fertilizer can be deposited with every hill of corn planted, the better.

Corn planted with checkrower is susceptible of being cultivated crosswise, so necessary for level culture to be followed by wheat.

Soon after being planted, all corn ground should be harrowed with some light harrow. This keeps the ground in proper condition, and kills innumerable weeds that start in the ground surface. It is no small satisfaction to see these shining millions of weed rootlets wither in the sun's rays at the rate of thirty acres per day.

By this harrowing the corn gets ahead of the weeds, which being followed by careful cultivation, will mature the corn and prepare the ground for wheat. With a five hoe and one horse drill this ground can be sown to wheat at the rate of six to eight acres per day.

When wheat is to follow corn there is no necessity of waiting till the corn is shocked, when it may be too late for wheat growing. If the corn is lodged help can be sent forward to clear the rows.

Good varieties of thoroughly cleaned seed are necessary to preclude the oft-repeated fallacy, that the wheat turned to cheat. A prudent farmer will secure the corn crop without material injury to the wheat.

The rotation of crops necessary for the best results is this, in my opinion :

The following March sow forty-eight quarts of clover seed to twelve acres, which Brother Terry says he can do in the morning before breakfast.

The labor of sowing clover seed by machinery is very much reduced compared with taking a few grains between the thumb and fingers to scatter over the ground. So also is the use of clover roots in the ground much better understood. They bore innumerable holes in the hard clay soil four feet deep, to let the water off and the air in, filling it with humus matter, bringing up the fertility from below, and rendering it friable and more available for agricultural purposes. Besides its availability as a fertilizer, but few crops will pay better than two tons of hay and three bushels of clover seed per acre in one year, if we can abate the grasshopper nuisance.

From the mistakes of the past, progress should be made by adopting better methods in the future. We should be as inventive as are those who manufacture our farm machinery. The reaper of to-day and that of half a century ago, illustrate the onward march of improvement. Two men and three horses with the improved self-binder can now put in shock twelve acres of wheat in one day, when it would be difficult to find twenty men who would do the same work in the same time with the old fashioned sickle.

Potatoes can now be planted, dug, picked up, and assorted by machinery.

By the use of the Eureka mower and Nicholson loader and stacker, hay can be put in the rick for fifty cents per ton, and should be done before wheat harvest for best results.

The farmer who expects to succeed must carefully select the best implements for the crops he expects to handle.

Much time and loss can be saved by proper methods of shocking grain. When properly put up, the caps are seldom blown off, and under them, after a rain, the grain will be as dry as if under a shingled roof. In large fields considerable expense can be saved by threshing from the shock if the weather is fine. The bundles can be fed to the threshing cylinder with less expense than they can be placed in a rick or barn.

When wheat in good order is safely stored, it is generally better to consider carefully the probable world's supply and demand before selling.

Mere physical force without consideration is of but little avail.

All our abilities and experience, combined with the experience of others, should be exercised in determining when, where, and how to direct our energies for the best results. With equal assiduity should we select our farm stock.

Thoroughbred animals are within the reach of most farmers, at least for raising grades. Five or ten dollars in the difference of a calf, with the same feed and attention, will generally make again of from thirty to forty dollars in the matured animal. The sooner we rid ourselves of scrubs the better our prospects will be. This is verified every day in the prices of sheep, hogs, cattle, and horses. Short pastures, scant feed, and bad care in winter are sure to make short profits. Quite too many who have but one cow to care for, leave her through the cold winter storms to enjoy the warm side of a rail fence, while they are quaffing the soul-destroying beverage at some village saloon. Fortunately for the cow, such persons seldom own but one, nor that one long.

Winter shelter should be provided for all stock, if nothing but a rail pen, covered with straw. Leaving tools to rust and rot where last used may not be as cruel as to leave the live stock unhoused, but is alike unprofitable.

Many, through mistaken economy, hire cheap hands, who can neither do, nor be told how to do work properly. It is better to give a good, reliable, experienced hand good wages, than a lazy, careless one his board. Such help, if the employer is not expected around, and the fence is not of barbed wire, will generally be found sitting thereon. The loss and ineffectual use of teams and the probable breakage of implements in such hands, should be considered in hiring farm help. It requires but little skill to crowd a board through a planing mill, furnished with guides; but to cultivate crops requires thought and energy at every point for improved success.

The Great Architect has placed in the air we breathe, and the earth we cultivate, an inexhaustible source of production to unknown depths, limited only by our power and skill to develop. Concert of action in hiring help, buying and selling to meet their various wants are as necessary for the agriculturist as for those of other trades.

Many apparently minor industries are neglected that might furnish material profit. Millions of eggs, for example, are imported into our country annually. Certainly, we have the raw material in abundance to produce this concentrated, ovarious food. The children should learn from Fanny Field in the Ohio Farmer, how to meet this growing demand. Raw silk is another industry that might be made profitable by delicate hands. On account of its concentrated value in small weight, like wool, it may need protection. Our raw products in mineral wealth should be manufactured into the most available forms to supply the world's demands.

Sheep-raising, one of the most important, and general industries of our country is now languishing for want of proper protection. All farmers are interested in the success of this industry, whether they are directly engaged in it or not; if successful, it would relieve competition in other branches of industry. The English farmer is now vigorously knocking at the door of protection. Well, may he, in view of the depreciation in land value, and in the products therefrom. All progressive nations are extending colonization schemes wherever a footing can be obtained. Improved farm implements are being sent to every quarter of the globe, with skilled operators to teach cheap labor how to use them. Railroads are extending to convey the various products to marketable points. All, with cheap ocean transportation, help to accumulate farm products, and cheapen them in the markets of the world. Under such circumstances, we cannot afford to export the wealth of our soil in the raw cereal in competition with Australian and India wheat produced by cheap labor. As "coming events cast their shadows before," it may not be long 'ere foreign wheat will be offered in our markets. There are now 90,000 tons of Australian wheat available for export.

It is not promotive of our national welfare that our laboring classes should

be in direct competition with foreign pauper labor. Bread and water alone cannot perpetuate prosperity and happiness. The laboring classes have a preponderating power in our government. Prosperity and safety require that they should be properly fed, clothed and educated.

Germany, the most prosperous nation of Europe, has the highest type of protective policy, closely followed by France. Under this policy, the condition of their laboring classes has materially improved. If these nations can so prosper under such high protective measures within their narrow limits of climate, soil and productions, how much better can we afford to carry out such a policy; with a country reaching from ocean to ocean, and extending from the tropics to beyond the polar circle, embracing in its vast expanse every variety of climate, soil and production, and in its depth a varied and untold mineral wealth.

Well may we snap our fingers at the nations of the old world, protect our extended industries, and shut out the products of foreign proper operatives so as to properly remunerate our own laboring classes, clothe ourselves from our own cotton, silk, wool and Alaska furs, and regale ourselves under our own vine and fig tree, build up a permanent home consumptive demand for our farm products by increasing the number of operatives outside of agriculture, and dependent upon it for food and material for fabrication. The less we buy abroad, the more we manufacture at home, and the more operatives we have to consume farm products. Home consumption must be made the main stimulus for farm products, and should be carefully considered that they may be supplied.

The farmers' class meetings should be attended, the grange, farmers' clubs and institutes. All have a material bearing on his welfare. They direct to an intelligent unanimity of action for the best good of all which is above any party consideration.

Farmers should think more, read more, and act in concert in all their business transactions, adopt better methods of farm management, see to it that their just rights are secured, and better laws enacted for their proper share of protection. Then will the great object of their desires, success in farming, be attained.

THINNING: A LESSON FROM HORTICULTURE FOR WOMEN.

BY MRS. D. E. BEACH.

[NOTE.—By some mistake, the address of the author of this admirable essay was separated from the Ms. Will any one who knows please inform my successor, L. N. Bonham, Secretary, at Columbus, that he may express the usual "author's copies" to its writer. This and others that follow are given as samples of many essays on social and domestic subjects, read by ladies at the different institutes.] W. I. C.

"About this time," in the language of the old almanacs, "look out for seed catalogues." They are very fascinating literature, with their gay covers and pictures of impossible fruits and vegetables. But for our purpose to day, one sentence from their pages is enough: "Sow the seed in a carefully prepared bed, and when the plants are two or three inches high, *bodily thin them out.*" However diverse the style; however varied the directions for cultivation of fruit, flower, or vegetable, this process of thinning, with its kindred one of

pruning, is never omitted. Familiar to all who depend upon the soil for use or beauty, it may serve us as an object lesson from which to draw a few principles that may be of use to the mothers and home-makers of our county.

We find ourselves in the midst of surroundings, often not of our own choosing, and which cannot be changed by any act of ours; with heavy burdens pressing upon us; with desirable pleasures apparently out of reach. We find ourselves with a two-fold nature, body and spirit, each with its needs and laws of growth; each with its possibilities. We find ourselves moreover not standing alone, but members of families, often the very main spring of the home, members of neighborhoods, communities, churches, each with its duties and responsibilities accordingly. We see, too, that nature in her prodigality makes no distinctions. She gives clouds and desolating storms as well as sunshine and fruitful showers. She sends fruits and grains, but also weeds and noxious insects into our fields. She sends fresh air and sunlight into our houses, and also dust and decay. She endows our bodies sometimes with strength and beauty, but often with deformity and frailty. In the spiritual world also her gifts are mingled good and ill. In our own hearts and minds we find habits of thought, peculiarities of mental vision, biased dispositions, irritable tempers; and in our husbands and children and help, the same difficulties to contend with. How can we, with all these adverse surroundings, in the midst of this constant struggle, make our lives worth living? How can we, out of all these elements, evolve a home of comfort and beauty? How can we create within its walls an atmosphere that shall develop all that is truest and best in those to whom it is the breath of life?

The question is three fold, but the problem is one. For whatever makes the most of the wife and mother yields the richest returns in the home. The highest form of self forgetfulness sometimes is remembering self. If the mother thinks nothing of herself the family are apt to think nothing of her also, a process not at all beneficial to them, however much it may foster the graces of humility and meekness in her.

Again, whatever adds to the beauty and comfort of our homes has its refining influence on the inmates of them, and is a factor in producing the finished result we desire for our sons and daughters.

This, then, is the problem that confronts every woman who is the head of a household; a problem that must be solved unless we are willing to accept defeat and own our lives a failure.

The help that I offer toward the solving of this problem is found in the principles of the horticultural process of thinning.

Look at your garden on an April day. The bright green lines across its surface delights your eye, and estimating the myriads of seeds that have germinated you look forward to a bounteous harvest. Make the experiment; leave the young plants to struggle with each other for room and sunlight, till a few misshapen and stunted survive the unnatural conflict, your sole return for the promise of the spring. But if instead, in the language of the catalogue, "you boldly thin them out," till each root has its needed space and can stretch its fibers and send up its leaves to the sunlight, the heaping measures of well-formed products will reward your sacrifice.

But this is no hap-hazard, blind process. The gardener knows the nature of his plants, some requiring more room than others. He uses discrimination in the selection, leaving the strongest, the stockiest, the best shaped plants. He also thins his rows systematically, not pulling out all the plants in one-half, and leaving the other half as densely crowded as before. And lastly he sacrifices the lower to the higher, the rampant growth of the vine is pinched off that more and larger fruit may result.

Transfer these principles now to the solution of our problem.

Thin out our work. Thin it out intelligently. Thin it out systematically, sacrificing the lower to the higher. Look at this picture of life on some of our farms, and recognize it as the counterpart of many homes we have seen :

"If you get out our way, doctor, I wish you'd stop and see my wife. She ain't feeling well."

"What are some of her symptoms?"

"Well, this morning after she had milked the cows, and fed the stock, and got breakfast for the hands, and washed the dishes, and built a fire under the soap kettle down the lane, and done a few chores about the house, she complained of feeling kinder tired. I guess her blood needs thinning." That woman's work needed thinning more than her blood, and the prescription is applicable to many of us. We must cut down work as well as expenses. We are frugal in the use of money, but very great spendthrifts of strength and life. But, to carry out this thinning process with success, it must be done intelligently.

The confidence with which a young girl undertakes the work of home-building and keeping, without the slightest knowledge of its requirements, is often sublime, and its results are quite as often next door to the sublime. There is room here for the use of the faculties we boast of, and all the knowledge we can acquire.

We need to know the laws of health that we may provide for the wants of the physical nature; we need to understand the relations of time and space that we may plan the shortest and quickest mode of accomplishing anything. We need to understand the laws of drainage and the nature of soil to improve the sanitary condition of our homes. We need a knowledge of chemical combinations and of the nature of gases, and fluids, and solids. We need to understand the labor question, and the laws of supply and demand, and the other social problems involved in our relations to domestic help and to neighbors. We need to understand the laws of mind, and the intricate workings of spiritual forces to deal justly and wisely with our children. For how can we choose intelligently in each and all of these directions what is best for ourselves and our families without knowledge.

For choice is inevitable. None of us can do everything; none of us can be everything; none of us can have everything. Intelligent choice and intelligent thinning are equivalent. Thinning out intelligently the unnecessary for the necessary; the unprofitable for the profitable; thinning out equally, not making our lives one sided by ignoring the wants of the higher, and devoting all our time and strength to our lower nature; by these methods we shall successfully solve the problem before us.

But my essay, so far, resembles a guide-board with its long arm pointing down the road, on which the maker has forgotten the inscription. It points out the way, but does not tell where it goes, nor how many miles we must travel to reach our goal.

Thin out our work! But where and how the over burdened housewife exclaims. Let us study then the practical workings of these principles.

Our first business is and always must be with the physical nature. Food, clothing, and shelter are the great wants of our families, and the daily recurring care of providing these in due proportion and in right condition is to many of us a burden so heavy, and of such constant pressure as to leave neither strength nor time for anything else. To thin out this seemingly necessary work, first, have all the help you can afford, and when you have secured that have a little more. Get extra help for extra occasions. If there are extra hands in the harvest field, or the "threshers are coming," provide extra hands in the

kitchen to wait and serve. I know we often congratulate ourselves on having dragged through such occasions without extra expense, and perhaps see no immediate bad consequences, but all such avoidable strains use up the reserve force that will thus be found wanting when the inevitable call for them is made. We did these things with apparent impunity when we were young and ambitious, thinking to add another field to the farm, or another hundred dollars to the bank account; and so in middle life, when we are needed more than ever to provide a happy home for the growing sons and daughters, we are broken down, fretful invalids, and it takes all the bank account and a good slice from the farm to make good the damages.

I am a full believer in the dignity of labor, and consider no form of it which adds to the health or comfort of husband and children unworthy a woman's hand; but with the average woman's strength and with the average claims upon it, she cannot accomplish all that life demands of her without help, except by sacrificing something more valuable. This making use of help in our work does not mean the surrendering of one of its most important departments; the preparation of suitable food; the sanitary condition of our homes, etc., to the ignorance or carelessness of unskilled labor. It means rather the wise supervision, the careful and patient teaching, the ability to use the raw material (some of it very raw indeed) in producing the finished result. It means the use of brains, which American women claim to possess to an extraordinary degree, instead of muscle, which they lack quite as conspicuously.

But necessity is a hard mistress. Help is scarce or poor. The farm small, the children numerous; the purse scanty. What can be done then?

Thin out the work, but thin intelligently. Decide for yourself what is needful and what superfluous. A large part of our so-called necessities are only concessions to our neighbors. Make the table plain, which does not mean untidy or with poorly cooked provisions. Of two dishes equally healthy and palatable, choose the one most easily prepared. Forget the cake and pie often enough to have their appearance hailed as a treat. Use more fruit as God made it, and not torture it by canning and jamming, preserving and jellifying; or even "tell it not in Gath," let a few apples rot under the trees, or a few berries feed the birds, if by that means we may gain health and time. True, a wise economy teaches not to waste anything, and the "little leakages empty the barrel." But when a woman cans herself with the berries, or dries up her youth with the strings of dried apples, or evaporates her own life in the sulphur fumes of her evaporating machine, it is a costly economy. This thinning process need not stop with the kitchen. Keep clean for the sake of health, but learn the easiest way of doing so, and sometimes shut the eyes to a little harmless dust or inoffensive cobwebs. "Cleanliness is indeed next to Godliness," I know, but it is only next. Buy better material and less of it, and make it up more simply, and so lessen the everlasting clatter of the sewing-machine.

Again, if you can't get "help," then get *helps*. If you live in an age of invention, improve your opportunity. If your husband rides on a sulky plow, or cuts his wheat with a reaper, cultivates his field by horse power, or raises the water for his stock by the wind, provide yourself a sewing-machine, a good pump, a wringer, a modern churn, a sausage cutter, an apple-parer, an egg-beater—I had almost said a dish-washer, but before that terrible problem the inventive genius of the age still stands appalled. These things cost money to be sure, but it is a wise expenditure. It is the woman usually who hesitates at these expenses, partly because she wants so much in other directions, but largely because of her inventive faculty, by which, with or without tools, she accomplishes an undertaking while a man is trying to prove that it cannot be done. To be sure, she uses tools in a way to make a careful mechanic groan,

and saves money as fast as the man who used up a set of forks in his endeavor to avoid the expense of a ten cent cork-screw.

Again, thin out by making use of whatever others can do for you better or with less outlay of strength than you can do for yourself. Get rid of the soap-kettle. Why should a woman make soap any more than weave cloth? Certainly not for lack of knowledge, in this age of advancements, that Ivory soap has cleansing powers; and even economy must relinquish her iron grasp here, for the ashes fertilize the growing crops, and the fat brings rich returns of eggs and chickens.

This may stand as a representative of a large class of employments, any one of which may be done with ease and success by the average woman, but all of which undertaken by one pair of hands constitutes the burden that is breaking down so many of us.

Thin them all out. Make use of the products of others' skill, thus serving your country by diminishing the cry of over-production, and be at the same time better served yourself with health and strength, and time left for higher uses.

As usual, the lower and physical has occupied the time, leaving but a few moments to extend the application of our process of thinning to the higher and spiritual. Can we thin out our work here?

I am afraid what most of us need here is not thinning but transplanting to fill the vacant places that all the ground may be occupied, and the harvest be abundant. But this is no less an application of our horticultural lesson. Why does some master of the profession prune a choice apple tree this year on one side only? Because he sees that the other side is dwarfed. He checks growth in one direction that it may be hastened in another. Not only the development of the tree, but its symmetrical development is his aim. What then is the meaning of this thinning process as applied to our higher duties? It means doing less sewing—not that we may spend more time in fancy work—good, honest, straight-forward sewing is no more injurious to health than crazy-quilts or embroidery; but that we may have time to walk, to ride, to breathe in life and vigor in the out door air. It means taking time from cooking and dusting and sweeping, not to use it in foolish or worse than foolish reading, but in the use of good books—good fiction in its place, but also something besides fiction. A story is not the less interesting because it is true, and called history.

It means less canning and preserving that we may store up sweetness and cheer from nature and literature and art. The bee whose well capped cells attest her summer's work has gathered honey from many fields.

It means giving our children plainer food and clothes that we may have time to be something more to them than a nursery-maid that washes and dresses and puts them to bed. It means time to talk to them, to sing to them, to love them, to walk with them, to listen to their questions and give the right answers, to understand them, not treating them all alike as so many garments cut by one pattern. It means taking time from their lower needs to keep ourselves in accord with them, to grow with them as they grow in wisdom as in stature, so that our daughters shall have no more trusted companion or friend, and our sons no more beautiful vision of woman, than their mothers. It means time secured, by giving up even what may be in itself desirable, for our own spiritual re-reshment. It means time gained from useless or burdensome social customs, to be spent in social reforms. It means the lightening of our burdens, that we may have strength to lift off the heavier burdens of those too weak to bear them. Is there not ample room in all this for the application of

the principles of our theme; for intelligent choice; for sacrificing the lower to the higher; for cutting off the branches for the sake of the ripened fruit?

Here endeth the lesson. If it has to any one made life seem less of a burden, and more of a glorious opportunity, its purpose is accomplished.

BRIGHT PLOWSHARES.

BY MRS. E. I. LAMPSON.

[Read at the Ashtabula Institute, Jefferson, Ohio.]

A farmer who neglects his tools and machinery, allows mower, reaper and plows to be left out all winter, to corrode and rust, wagons, sleigh and hay-rigging to remain unsheltered through sunshine, wind and storm, to rot and decay, scarcely realizes how much he pays for this neglect. Every successful farmer sees the necessity of keeping his farming implements bright, free from rust, and in good repair. He knows that more and better work can be accomplished, and in less time with tools and machinery well cared for, and the rust of newness or of exposure or disuse taken away. He knows that all the running parts of machinery should be kept well oiled, or the parts become dry, expanded, run hurder, and soon wear out. That a bright plowshare will cut easily and smoothly through the soil, lay up a better and straighter furrow, and in less time than one with a dull, rusty point. So with the faculties of our mind. The keen intellect kept active and free from the rust of disuse, cuts its way smoothly gracefully, grandly through the difficulties of life, while the dull, inactive one wears itself out against the simplest problems.

The mind indeed, like a machine, may be kept bright by use, while the inactive mind becomes as rusty and useless as the discarded plow in the fence corner.

In no department of excellence are there greater rewards offered or pleasures to be enjoyed than in the pursuit of knowledge and intellectual culture.

To crowd the mind with dry facts or with a mass of undigested knowledge is not the way mental culture is to be secured, "Learning without thought is labor lost." We must read, think, observe, keep the ears and eyes busy with the things about us, and bring to perfection the power given us.

Webster says, "knowledge does not comprise all which is contained in the large term education. The feelings are to be disciplined; the passions are to be restrained; true and worthy motives are to be inspired; a profound religious feeling is to be instilled and pure morality inculcated under all circumstances. All this is comprised in education."

In days gone by, too many imbibed the idea that education must necessarily cease with school days, or when the duties of active life began, but now learning is scattered broadcast, and every boy and girl receives what was once given only to the highest in the land. Now, ignorance is not a thing to be lightly looked at and excused; it is a sin. One has to think and read much, to keep abreast of the tide, or even to appear tolerably intelligent and well informed.

The farmer or other individual who reads, studies or writes in connection with his manual labor, enjoys life most and lives longest. The unused mind rusts out and when the motive power is gone, life becomes mere animal existence. It is only when we begin to think, and use our intellectual endowments, that we rise to the dignity of rational beings.

One who lives in the country or on a farm has an opportunity of studying nature in all its phases and adding daily to his store of knowledge. Observe the haunts and habits of the birds and bees, watch the industrious ant and other insects, study the flowers and all that their beauty was intended to teach us. Oh flowers! ye are God's silent teachers! Awed by your presence silently we ponder the ways of God. No one can feel alone and unloved, surrounded by these emblems of God's love and care. Even the much despised white daisy is one of God's thoughts, and the warm sweat breath of the wild rose, takes us back to the days of our childhood.

What a wonderful field of study there is in the meadow, garden and wood. Look at the fields of sweet scented clover and golden grain; the gardens of fruit and vegetables, all speaking of the bounties of indulgent Heaven; and the forest, can we look at it either in its spring and autumn foliage, or winter's nudeness, without exclaiming with our much beloved and departed poet:

"The groves where God's first temples, * * *
Thou has not left
Thyself without a witness, in these shades,
Of thy perfection. Grandeur, strength and grace,
Are here to speak of thee."

How few observe or enjoy these things! How much we miss daily and hourly, through the lack of this special training of our faculty observation.

Busy house mothers, how often through the weary days of spring and summer, do you look out through your kitchen window, away from bread-board and floury rolling pin, to the inviting orchard or up to the cool fringe of wood not far away, and wish you could drop pie-plate and cooky-tin, and throw yourself down under their grateful shades, and inhale the pure air, and forget for a while household duties and cares! But why not, why not take the little folks out for an hour, to enjoy the cool shade of the trees, whose very leaves are in motion, beckoning you into their delightful shadows? Oh, I cannot stop, is always the word, always work needing to be done, and so spring and summer go by, and all the beautiful green things bud, blossom and die, in wood and field, and you do not see them.

Is it right that we always deny ourselves rest and leisure, and time for culture and improvement, even if the work is left undone? To be sure, we are taught that we are to earn our bread by the sweat of our brow. It is right that it is so ordained, for idle hands find mischief to do, but I cannot think it is God's wish that we should be so cumbered with household duties and farm work, that we cannot have time to cultivate the mind and soul, to watch, notice and enjoy the beauties of God's creation. But so many women will say: "I have no time for study. The work that needs to be done requires all my time and strength." True, the domestic work of life needs to be done, proper food and clothing are necessary for our health and comfort, and a well-kept home is a heaven to any soul.

But my dear sisters, did you ever consider the moments that go by comparatively unemployed? What do you think about while you are doing the family baking, getting the daily meals, or washing the dreaded pile of dinner dishes? I have a friend who, while about her household work, keeps an open book on some interesting subject, on the shelf above her kitchen work table, and while she prepares food for the body, she feeds the mind with some fact of history or science, or enriches the soul with a beautiful thought from some of our poets. Study and thought lighten labor and make the daily routine of domestic life seem more pleasant and less burdensome.

It is said that Mrs. Stowe wrote her most popular work in the kitchen, and

in the intervals of culinary duties, and we know the book was a success, for it stirred the heart of this great Nation to its profoundest depths, and we have no record that the dinner was a failure.

Farmers, while you prepare the soil for seed, or gather in the bountiful harvest, form the habit of keeping the mind employed with thoughts that enlarge and elevate the mental powers. Farming is of such a nature that it can be made mechanical. The hands may hold a plow, while the mind absorbs or conceives a noble thought. Carry in the pocket a little text-book on science, history, or agriculture; what matter if it does crowd the tobacco-box out to give room for the book; let it form seed that will ripen into the grandest results and a rich harvest of knowledge.

"Burns, the plowboy," was afterward the sweet singer of Scotland, and we have evidence that some of his rarest gems of poetry were written while engaged in rural pursuits. To be sure, we cannot all be a Harriet Beecher Stowe, or a Robert Burns, but we can be our own individual selves, and improve the powers given us.

We forget that "what others have done we may do." We stand at the gate of the "palace beautiful" longing to enter, envying those who have already overcome the obstacles and are enjoying its pleasures, unwilling to cope with the "lion in the way," unwilling to pay the price, patience and labor. By perseverance the very odds and ends of time can be made to yield wonderful results.

Heaven has bestowed upon us many gifts, and has still greater ones in store for us if we use the ones already received, for "unto him that hath shall be given." Parents, we cannot too early teach our children the value of these gifts. We are directly responsible for the proper development of the mind, body, and soul of our children, and no amount of work can excuse us from this divine calling. We should teach our children that we are not our own, but a unit in working out the great plan of life and eternity; that our powers are given us for use, and we should not like the "servant who received the one talent," bury them in the earth, but should put them to the greatest possible use. Teach them to love knowledge, and searching after truth, and to pry deep into the hidden recesses of nature, for there is a boundless realm of truth and pleasure.

"There is much that gives pleasure in all that's around;
There is many a treasure where least it is found."

We should, as far as our means permit, give our children a liberal education. We can at least give them a common school education, and surround them with good books and pure literature. If we neglect to do this, we cheat them out of what is rightfully their own. The love of the beautiful and of the acquisition of knowledge, is almost a sure safeguard against the excitement of passion and vice. We cannot overestimate our responsibility in this work, and to wisely, skillfully, and intelligently guide our children from one stage of development to another. We must be constantly adding to our store house useful knowledge which shall ever be at our command.

It is hoped and expected in this day of inexpensive literature on all subjects, we may become better informed, broader in our views, more liberal in our opinions; that we may develop the highest and best faculties given us, and as we decline in years, we may grow venerable in age, and pleasing for what we may impart; that we may keep the plowshares of life bright and useful; that we may not rust out before our time. Many say I am too old; it is too late. I cannot study and think as I could once, and thus let the machinery of their minds slowly but surely rust away.

To me one of the most interesting incidents at Chautauqua, on commencement day of '82, was that of a dear old grandmother, who had completed the

course of study and passed with the class through the golden gate, under whose arches none are allowed to pass excepting those who have completed the course of the C. L. S. C. The dear old lady who had already seen more than eighty summers, seemed young in the joys and pleasures of that day. Perhaps ere this she has passed through the golden gates of eternity, better prepared to enjoy the wonders and pleasures of the great beyond than had she neglected the talents that were given her here.

“ Say not it is too late.
 Ah! nothing is too late,
 Till the tired heart ceases to palpitate.
 Oato learned Greek at eighty; Sophocles
 Wrote his grand *Ædipus*, and *Simonides*
 Bore off the prize of verse from his compeers,
 When each had numbered more than four-score years,
 And Theophrastus at four-score and ten,
 Had but begun the ‘*Character of Men*’;
 Chaucer at Woodstock with the nightingales,
 At sixty wrote the ‘*Canterbury Tales*’;
 Goethe at Weimar, toiling to the last,
 Completed ‘*Faust*’ when eighty years had passed.
 These truly are exceptions, but they show
 How far the gulf stream of ones youth may flow
 Into the arctic regions of our lives,
 When little else than life itself survives.
 Shall we then idly sit us down and say,
 The night hath come; it is no longer day.
 The night hath not yet come; we are not quite
 Cut off from labor by the falling light,
 Something remains for us to do and dare;
 Even the oldest tree some fruit may bear,
 For age is opportunity no less
 Than youth, though in another dress;
 And as the evening twilight fades away,
 The sky is filled with stars invisible by day.”

REFORM ON THE FARMER'S TABLE.

BY MRS. B. F. PAYNE, NELSON, OHIO.

[Delivered at the Portage County Institute, Ravenna, Ohio.]

I take it for granted that all the farmers' wives present do, or at least over see their cooking, and consequently my subject needs no apology. While we are hearing a great deal of political reform, dress reform and temperance reform, is there not an opportunity for reformation in our cooking, and in what we place upon our tables? We need to pay more attention to the quality and the variety of our food, and especially to the manner of cooking it. How seldom, when cooking, do we take into consideration whether we are cooking the article in the best way possible, or to that degree in which it contains the most nourishment, and is the most healthy.

Many have the habit of cooking everything until “It is done,” as they say, and this usually means cooked to the point beyond which it cannot go without burning. Many articles of food thus cooked are indigestible, and it is only from force of habit or for manner's sake that we eat them at all. Food thus cooked cannot be eaten after it is a day, or even an hour old, consequently

there has grown upon us the habit of eating everything hot from the cook-stove. "Oh! our folks won't eat anything after it gets cold," is the exclamation of the farmer's wife, as she makes warm cakes for breakfast and supper, and warm bread for dinner. There is a kind of false pride afloat of eating nothing stale. Many times we hear the vain boast of some foolish wife, "Yes, I bake pies every day; we like them fresh." Would it not be better in many ways if fruit between layers of lard and flour, called "pie crust," were eaten in its natural form, or cooked as sauce? Good sauce with light bread and pure butter would be much *more* healthful. Some families think they must have their pies three times a day, but can they intelligently say that their bodies or their brains are any better for the pie? I think not. Another item which I think is by no means of small importance, is the many hours spent in a hot summer day around a still hotter cook-stove. Can a mother, after cooking her flesh and brains, be as cheerful as she ought to be to make home pleasant? Can she have the patience that she ought with the wants and troubles of her little ones? Impatient words escape us at such times and perhaps a little one is spoiled while we have succeeded in serving everything at the table hot from the kitchen. Even if it were just as healthful to eat everything while steaming, we as farmers' wives can not afford the time necessary to serve everything in this way. Let us leave it to those people to eat everything hot who can have plenty of servants. We cannot afford thus to ruin our homes. As to the variety of our food, I think we pay too much attention to it.

The constitution of the human system is such that it demands that it be not always fed upon the one and the same variety of food, but when we have a sufficient variety, why are we continually seeking some new way to serve our food? Every week we are told in our farmers' papers of new ways of combining our cooking elements, and thus the variety upon our tables is increased for we do not drop old ways in the same ratio that we take up new ones. In this I think we have sadly fallen back. The old-fashioned bowl of bread and milk, baked apples, cheese, or dried beef, with a piece of plain cake, contained far more nourishment and good health than a whole table full of fruit cake, jelly cake, angel cake, delicate cake, variety cake, pies and tarts to correspond. It would be far better to eat the fruit in its natural form than to be always trying to improve on nature. How much more we should have enjoyed our friends' society if we had not exhausted ourselves before they came in preparing several kinds of cake, pies and other nicknacks. "It is fashionable," or "customary," they say, and follow custom regardless of health and happiness. Let us pay more attention to the food that will give us health, strength and muscle. Milk and cream, how seldom we see them on our farmers' tables, and they, of all people, could have a generous supply at all times, and we all know there is hardly another article of food that supplies the whole needs of the body, and yet, how little of it is used on the farmer's table.

A great many of our farmers' wives think they must have a cooked supper. After the men have worked hard in the harvest field, they think nothing but a hot supper will answer. Instead, if they would have a pitcher of milk, and bread to go with it, tea, sauce and a plain light cake for supper, the family would enjoy a better night's rest, and feel more refreshed for the next day's duties with less fatigue for the wife and mother. And vegetables, we as farmers can have those in abundance nearly all the year. Do we use them on our tables as we might? And they are considered healthful for every one. Oat-meal and Graham, let us not slight those entirely, for they will play no small part if allowed a space on our tables. I wonder on how many farmers' tables we can find a dish of apples? Though the cellar be half full, they are

nowhere to be seen at meal time when their acidity would especially aid in digestion. Try them farmer friends, and I think you will wonder that you did not have them on the table before. We, as Americans, have gained for ourselves the name "A Nation of Dyspeptics." If this name is ever proven inappropriate, there must be a reform in what we eat, and how we eat it. Is it not proper that this reform begin on the farmer's table? Some will say nonsense to all this, but if we would care a little less for our appetites, there would be less doctors' bills to pay, and fewer grumbles in the world. Let wives, and especially mothers, spend more time in improving their minds that we may keep a nearer pace with our children, and encourage them by so doing; also a lively interest in home affairs, and spend less time in getting up a variety of warm things to please a present appetite, and we shall be better satisfied with our work.

HYPERION.

BY MISS MARY COE.

[Read at the Union County Institute, Marysville, Ohio.]

In the far off land of legend stands a great forest. On one side of this forest is a beautiful tree, almost faultless in form and coloring. Her graceful boughs, covered with bright leaves and blossoms reach out to her sister trees and upward toward the sunlight and heaven. The birds sing merrily in her branches. Wild flowers, attracted by some invisible power, are blossoming all about her feet. Her own life, the result of her effort to see all good and beauty, has grown into something beautiful and useful, and it lived, as it were, in another sphere, a purer air, above all little ignoble thoughts and deeds. Her sister trees receive from her sympathy and cheer, and are lifted up by her influence, and all life is made happier and better.

Wending his way through the forest of beautiful trees, the traveler, after a time, reaches a less happy circle. The trees are discontented, selfish, and unsightly. The tree in the midst of this circle, makes a sorry picture when compared with her sister on the opposite side of the forest; her boughs have few leaves, and these withered and ready to fall. She does not lift up a branch toward heaven, nor does she reach out to those about her, but indifferent and selfish, her boughs droop toward the ground, which is bare of any flower or living thing. The whole appearance shows some defect in the heart of the tree. Her gloomy shadow has chilled and driven away birds, flowers, and friends. She lives within herself, shutting out of her life all good and beauty, and coloring darkly the lives of those about her.

As every nation has some characteristic, we Americans have ours. Our standard of measurement for everything is utility. We are inclined to consider useful only that which in the end makes money.

We are becoming too exceedingly practical. No one, however, will say that a desire to get money is not legitimate, right, and necessary. But certain it is that our word "utility" has a meaning broader and higher than this. Isn't that useful which makes one better, lifts one above one's self, gives one broader views and higher ideas of life, and fits one to fill just the one little niche God intended that one to occupy? Our lives are, in great part, what we make them.

Then let us have this fast fixed purpose—to secure to ourselves that discipline and culture, which will not only make life fuller, brighter, and more useful for us, but “the world better for having lived in it.”

Owing to the practical turn of mind of our forefathers, we daughters of the farm are very naturally neglecting one side of our education—a side for which we alone are responsible. Very truly has Jeremy Taylor said, “Life is like playing at tables, the luck is not in our hands, but the playing the game is.” We would not be uninterested in this game, and carelessly drift along, for it is impossible for one to drift into a noble life. We forget that in our every day life we have opportunities for culture which do not come through teachers and college life. The “common deeds of a common day,” which make up most of our lifetime, may not during our busy days give time to go to our books, but we may carry some good thoughts with us for these occasions. A little poem, a single verse, even a few good words, which we may have read at some odd moment, will give us new thoughts and feelings, and make days brighter. We forget that we are tired. All our petty trials are forgotten. We are carried away from present scenes, and our “narrow kitchen walls sometimes stretch away into stately halls.” Perhaps the two things most neglected in our busy lives are the cultivation of a love of the beautiful and the study of design or adaptation—for there is beauty and design in every bit of God’s creation. A thoughtful looking for beauty in everything, with a study of the law of design cannot fail to show itself in our homes—in the new order, economy, and harmony found there, while at the same time it must give us a truer and higher idea of all creation and its relation to the Creator.

We look at the beauty in some great natural object of work or art, but we forget to look for it in the little things with which we have to do.

We admire and wonder at the design seen in great things—each continent and country fitted for just the people who were to occupy it, and for just the part it was to play in the world’s history. We think, “what beautiful design!” when we read the “unwritten history” of early ages, from the rock formations, with their tiny fossils and delicate leaf impressions. In the forest, too, we see a use even in the falling leaves, which, having spent their beauty, fall to the ground to keep warm the rootlets, and make a hiding place for the wild flower. Applying this law in history, we see in every case a nation made ready for and ripe when its revolution came, a man ever ready for a great emergency, and so on. Were we able to trace this law in everything we should find everything adapted to every other thing, then we might notice here, that we are adapted to our particular places and circumstances, and our circumstances to us, remembering at the same time, that we have something to do with the making of circumstances. The study of design is just as interesting and profitable when applied in the kitchen and about our homes, in the little things—for little things are closely connected with great ones.

From looking at the design in the formation of continents, look at it in the little spot of earth about your home.

From reading “unwritten history” in rocks, read the unread laws of chemistry, in the changes which take place while your dinner is in process of making.

Then how oftentimes barriers are thrown in our way, directly opposite our pet plans and theories, and we feel that every body is out of joint with us; isn’t there design in this? And let us always be thoughtful for the beauty which lies every where, so closely about us. For what was it made but for our use?

Then is it right for us to be so buried in our work that the soul can never look out and enjoy what God made for its pleasure and good? It is a fact that too many of us are doing our work, day after day, with never a thought

that reaches beyond the mere act of work. It is believed that the beauty about us, of which we have no conscious perception, has an influence on us.

Then how much greater the good that comes from the cultivation of this taste. In whatever degree a thing is beautiful and appreciated by one, in the same degree is that one lifted up, given finer feelings and enabled to appreciate yet higher things. So there is a moral influence, so subtle that one can scarcely describe it. One cannot stop and look at the beauty of a wild flower without being made better.

If one has evil thoughts, the purity and beauty of the flower speak a reproof. No matter how busy the days, one has always the sky above with its wealth of cloud forms and coloring; always some little spot of earth; and if it contain no tree or flower, perhaps there is grass, which though not often spoken of as beautiful, nevertheless is so, if one will only see its beauty. Wherever we look for beauty we find it. There is nothing made or looked upon, but in it we find some degree of this element. It is said, "We always find what we look for; he who loves flowers will find flowers; and he who loves weeds may find weeds." And so it is that we may go through life without finding any flowers; without seeing any beauty or good in any person or any thing. Our work would then be mere drudgery; our minds narrow and little, and our hearts selfish and cold. Life would be a disappointment to us and a hindrance to others. Then why not always look for flowers?

When our days are full of work, look for beauty and good in the things and people with whom we come in contact. Our life, at best, is very short. We pass this away but once and are gone, to make room for other lives; so we would be getting and doing something which will fit us to fill grandly our place in the world. Then would the game of life be well played. Not only would our own life be nearer the ideal, but each life would help every other.

Whether we intend it or not, all the time there flows out silently from us an influence into the hearts and minds of others, either helping or hindering them.

Besides this silent power, our words and deeds are forever molding the character of other lives. Each one of us is the center of a circle of influence, whose waves extend and widen till every life is brought within the circle of every other life.

THE FARM AND THE SCHOOL.

BY L. H. WATERS.

[Read at the Belmont County Institute, St. Clairsville, Ohio.]

Every farm is a school and every school a farm; and however different may be the modes of cultivation in the one from the methods of instruction in the other, their aims and ends are the same—the perfection and happiness of mankind. Perhaps the lessons of the farm have a greater influence upon the character and happiness of a people than has the training of the school.

The farmer boy who, only after months of waiting, is rewarded for his patient toil in grubbing the thicket and tilling the field, learns a lesson of patience that he would never have learned by delving amid the sapless roots and stems of a dead language, or by plucking the insipid fruit from the leafless branches of the tree of knowledge.

Probably the most important lesson learned in the school of the farm is the lesson of independence. We often hear allusion made to the independent life of the farmer; but few of those who have never lived in the country can realize the truth of the statement when we say that the farmer's life is an independent one.

When we consider the relation of the products of the farm to those of other fields of labor we can, by comparison, arrive at something like a just estimate of the value of those products. In the simplest states of society, the products of the farm are sufficient to meet all the wants of man. And whatever may be his refinement and civilization, the most of his wants are supplied from the farm. For his food and raiment, for the horse that draws his loads, for the materials with which he builds his habitation, and for the fuel that warms him and cooks his food, he is dependent upon the farmer. The farmer being able to produce all these things for himself, is comparatively independent of the people who follow other occupations. And then being untrammelled by the conventionalities of city life, and not being subjected to the caprices of bosses and overseers, he is master of his own time; and by repeated lessons in self-reliance is inspired with a love of freedom. He soon becomes attached to the little domain over which he is absolute ruler, and unconsciously there grows up in him such a love of home and country as is not to be found among the trades and professions.

"True to their home, these faithful hands shall toil
To crown with peace their own untainted soil;
And, true to God, to freedom, to mankind,
If her chained ban-dogs Faction shall unbind
These stately forms that, bending even now,
Bowed their strong manhood to the humble plow,
Shall rise erect, the guardians of the land,
The same stern iron in the same right hand,
'Till o'er their hills the shouts of triumph run,—
The sword has rescued what the ploughshare won."

While the art of farming is the most ancient and honorable of all occupations, it is as a science still in its infancy. Until within the past quarter of a century but little was known of the chemistry of agriculture; but farmers are beginning to realize the importance of a knowledge of the composition of the soils, and their adaptability to the various kinds of crops, and there now promises to be as remarkable a revolution in the methods of the farm as that which has already taken place in the methods of instruction in our common schools.

Only a few years have passed since the tyro who possessed but an indifferent knowledge of the rudiments of the "three R's" was thought to be thoroughly qualified "to teach the young idea how to shoot." But the scope of school work has been so broadened and deepened that to be a successful teacher nowadays, one must not only have an adequate knowledge of the branches taught, but must also possess a knowledge of the powers and susceptibilities of the child mind, as well as of the best methods of developing those powers. It is well for us that we seldom find at the teacher's desk the ignorant and hard-hearted Squeers, or the kind hearted, though ignorant pedantic village school-master, whose portraits have been so admirably drawn by Dickens and Goldsmith:

"A man severe he was, and stern to view,
I knew him well, and every truant knew,
Well had the boding tremblers learned to trace
The day's disasters in his morning face;
Full well they laughed with counterfeited glee
At all his jokes, for many a joke had he;
Full well the busy whisper, circling round,
Conveyed the dismal tidings when he frowned;

The village all declared how much he knew ;
 'Twas certain he could write and cipher too.
 In arguing, too, the parson owned his skill,
 For e'en though vanquished he could argue still ;
 While words of learned length and thundering sound
 Amazed the gazing, rustics ranged around,
 And still they gaz'd, and still the wonder grew,
 That one small head could carry all he knew."

The successful farmer of the future will find it necessary to know not only something of the nature and adaptability of soils, but also of the best methods of cultivation.

The proper education of the farmer boys in the art and science of agriculture will be the most effective means of retaining them upon the farm.

As already intimated, this undue tendency to the cities will be most effectually overcome by a thorough training in not only this art of farming, but also in all those sciences which pertain to animal and vegetable life, and account for the various natural phenomena. The application of the science of chemistry to farming is daily becoming of more and more importance to the farmers of this section, where, in many localities, the once fertile soil has been impoverished by a too rapid succession of crops, and a lack of such a knowledge of the nature of soils as will enable the farmer to determine their adaptability to the different kinds of crops, and the best means of fertilization and keeping the soil up to its maximum capacity of production.

A knowledge of the subject of botany will help him to determine many points in regard to the cultivation and rotation of crops, and the planting and preservation of grain and fruit.

Physiology and zoology will furnish many facts of value in the care and management of live stock, as well as in the care and preservation of his own health. There are also many principles of natural philosophy that are useful to the farmer, if not absolutely necessary to the highest success in his vocation. This is especially true of the mechanical powers, and the principles of hydraulics and hydrostatics.

Now, I would not be understood as saying that the farmer cannot be successful without a knowledge of these subjects ; but that such knowledge would be to him of inestimable value.

Most of the farming, in its present state of development, is purely experimental, and only those who have served an apprenticeship upon the farm are at all qualified to manage the planting and cultivation of a crop. And yet, I do not mean to say that the knowledge of which I have spoken would enable one to engage successfully in the business without a period of actual training upon the farm. No amount of theory without practice will secure success in any calling. But these subjects are of vastly greater value to the farmer than a knowledge of language, literature or mathematics. Yet, notwithstanding this fact, the instruction of our country schools is chiefly in the line of literature and mathematics.

Besides the utility of the sciences they bring man into a closer relationship with the beauties of nature and the goodness of the Creator.

"The works of God are fair for naught,
 Unless our eyes, in seeing,
 See hidden in the thing the thought
 That animates its being."

The farmer is the stay and support of the nation ; he contributes the bulk of the revenue as well as the bulk of the ballots that make or mar its prosperity. How important, then, inasmuch as the great mass of the voters of our land

are in some way connected with its farming interests, that we should have an intelligent and an educated body of husbandmen. The destiny of the nation is in their hands; and it is theirs, in a large measure, to say what shall be the educational facilities of the land. And especially is this the case in our own State, where the educational interests of the farming community is left in their own hands. They are at liberty to say how long the schools shall be in session, and just what kind of a school they shall have. It is theirs to say whether the school shall be a good or poor one; whether their children shall have only the rudiments of an education, or shall have the highest education that our best schools can give them. The facilities of the high school are within the reach of every farming community in the State. But the establishment of such schools depends upon the enterprise of the community. Every township may have a high school, if it wants it, and will take the proper steps to secure it. In a number of the townships of the State they have already been established. But the chief difficulty now to be encountered in the establishment of such schools lies in the disagreement of the school officers of the township, which naturally arises from the many-headedness of our school system.

There are, on an average, no less than thirty school officers in each township, making a total of 40,000 in the State—an army four times as large as that with which General Scott conquered the Republic of Mexico, and almost twice as large as the standing army of the United States. It is believed that the only remedy for the innumerable evils arising from this source is to be found in a revision of our present school system.

One of the remedies, and, in my judgment, the best that has been offered, is the adoption of what is termed the "township system." This does away with about two thirds of the officers now connected with the schools, and places the schools of each township in the hands of one person who has power to employ teachers and provide for the schools of the entire township, there being but one local director, or trustee, in each sub district, whose duty it is to see that fuel, janitors, etc., are furnished to the schools of his district. It also provides for a central high school in each township, to which the pupils of the higher grades of all the schools of the township may be sent, and also for a township superintendent of instruction, who shall have charge of the high school, and shall have the general supervision of all the advantages of a graded system of schools within the reach of every family of the State.

County supervision is also strongly advocated by some, and possesses many advantages over our present system.

Ohio for many years held a place of honor among the States of the Nation in matters of education; but some of her sister States have now far outstripped her in educational progress. And as a result statistics show a larger percentage of illiteracy in our own Ohio than in many of the newer, but more enterprising States of the West. The people of Ohio are proud of the intelligence of the masses, and boast of their noble system of public schools; but there is little to boast of in an illiterate population of over 100,000—40,000 of whom (enough to fill all the school offices of the State, and three times as many as are necessary to carry the balance in a State election) are voters who are not able to scratch a ticket and insert the name of the man for whom they wish to cast their ballots. Yes, we are proud of our public schools, but they are far from being what they ought to be, or what they might be under proper management. The system under which our schools are now managed has admirably served the purposes for which it was created; but it has, in some respects at least, outlived the day of its usefulness, and if we keep pace with the educa-

tional progress of the times, it must be laid aside and something better supplied as a substitute.

But the revision of the school system is by no means all that our schools need. First, and foremost, we need a corps of active, energetic and efficient teachers who are qualified, mentally, morally, and socially, to lead our children in the search for knowledge.

And I may say here that probably the chief cause of there being so few good teachers in our country schools is the fact that the remuneration, in most cases, is so meager as not to afford a sufficient inducement for men and women of real excellence as teachers to remain in the profession, or for those who are not already thoroughly qualified for the work to go to the expense necessary to prepare themselves properly for making a business of teaching. But this state of affairs is largely owing to the carelessness, indifference or selfishness of those who employ them.

If school boards think it a matter of economy to employ a teacher because his services are cheap, they may expect to have a cheap school in more senses than one. This matter of remuneration has more to do with the kind of teaching that is done in our schools than any other one thing. Whenever the teacher's salary is sufficient to support himself and family without having to resort to some other business during the summer vacation, we may expect to have a superior class of teachers, and not till then.

It may be asked, why persons who are not competent to teach are granted certificates? It is simply because the schools must be supplied with teachers of some sort, and if a sufficient number of those who are thoroughly qualified do not make application, certificates must often be granted to those who are but poorly prepared to do the work required of them.

It is natural, however, for us to feel that what was good enough for us in our school days, is good enough for the rising generation. And some of us seem to think that a high degree of mental culture is incompatible with the occupation of the farmer—that in his narrow sphere he must necessarily be narrow-minded. But a glance at the world's history reveals the fact that many of its noblest heroes and most famous statesmen owe their strength of body and mind, their energy and push, to the invigorating influences of farm life.

Every nation has its Cincinnatus, and ours has more than one.

The country has ever been to the hero a sacred retreat, to the poet a classic land, where the forests re-echo the songs of birds, the valleys are covered with lowing herds, the fields all clad in their mantel of green, the quivering sunlight's silvery sheen are tokens of peace and plenty.

The monotonous life of a farmer is not all prose; to him who is willing to see and hear his life is not lacking in poetry. Burns was able to see the poetic side of the farmer's life, and many of his best poems were produced while following the plow.

"It is only by labor that thought can be made healthy, and only by thought that labor can be made happy."

Men are wanted in every department of life, who are earnest, active thinkers. As we learn to work by working, so we learn to think by thinking. There is no reason why the farmer should not be as good a thinker as a preacher or a lawyer. We cultivate the powers of the body by use, and in the same way we cultivate and strengthen the faculties of the mind. Practice makes us what we are mentally and physically. Even what are known as "natural endowments" are often the result of long practice and untiring energy. What makes the genius in poetry and art is oftentimes not natural endowment above that of his fellows, so much as the power of push.

Let the farmer boy think while he works, and he shall soon be able to realize that

His "are the hands whose sturdy labor brings
The peasant's food, the golden pomp of kings;"
His field "the page whose letters shall be seen,
Changed by the sun to words of living green;"
And he, "the scholar whose immortal pen
Spells the first lesson hunger taught to men."

Then

"Clear the brown path to meet his coulter's gleam!
Lo! on he comes behind his smoking team,
With toil's bright dewdrops on his sunburnt brow,
The lord of earth, the hero of the plough!"

POULTRY FOR THE FARM.

BY MRS. TURNLEY.

[Read at the Lake County Institute, Painesville, Ohio.]

Much has been said for and against poultry for the farm. In the past, no one branch of industry has been more neglected on the farm than this; one, too, in which there is so little capital invested for the amount of its returns. The value of the poultry, and of the receipts from it are considered so *small*, the general farmer makes no account of them. Now and then some one more painstaking, or one who wishes to convince all the world that his breed of poultry is the best in the world, has given a wonderful record to the public of the profits of *his* fowls. Poultry, to obtain the best results, must have good care. Not one farmer in twenty-five takes any care at all of his fowls. During the most of the year the poultry gather their subsistence from what would otherwise go to waste. In the winter a few ears of corn are thrown down to them once a day, perhaps; they roost in the tops of the highest trees, or in some old dilapidated building, the only thing to recommend it being its *perfect ventilation*. The farmer who keeps poultry in this slipshod manner, now and then becomes desperate, and declares "*every hen shall be killed—they don't pay*;" but this threat is seldom put into execution, much to the convenience and comfort of the family. The pullets kept in this careless manner are never winter-layers, let the breed be what it will, but this mode of keeping fowls is fast passing away with the old-fashioned hen.

The poultry interests in the past few years has advanced at a wonderful rate on the farm as well as elsewhere. To make poultry-raising a success requires a large amount of patience, a personal oversight, and constant vigilance. Perhaps to raise poultry on the farm requires less labor than when kept in confinement, but even here there are foes to encounter. Rats sometimes prove very troublesome, carrying off numbers of eggs or chickens in a single night. When the broods become older and go into the fields in quest of insects, the hawk takes his share.

Poultry are subject to some few diseases, the most common of which are termed gapes, roup, and cholera; of these, perhaps gapes is the worst. Very little seems to be known of the cause or how to treat it successfully. Many remedies have been tried, but in most cases have proved a failure.

Roup has every appearance of being a severe cold, affecting the throat and head, and prevails mostly among adult fowls. I believe that a large part of

the loss among young chickens is caused by over-feeding, or not giving the proper food. Watch the little chickens, when allowed to range at will; they are constantly picking, but are never filled to repletion. Let your motto be, *feed often but sparingly*. We need to study nature closely, and try and adapt our management to her dictates. In summer the hens on the farm, if allowed to range, will require but little food to be given them, but should have access to plenty of fresh water at all times. In the winter, when the ground is frozen and covered with snow, they require more food. Here, to obtain the best results, we need to exercise our judgment, and try and supply as far as possible, what the hen finds on the range. If the conditions are right, we can have a supply of fresh eggs in winter as well as summer. These are simply warmth and suitable food. If these are not furnished you will have no eggs in winter when they are worth double what they are in the warm months.

Poultry on the farm is profitable. The agricultural statistics of Ohio for 1884 report the eggs as worth for that year \$4,890,348. Some one may say, *that cannot be correct*; mere guess work. Then let us compute it ourselves. There are in Ohio about 200,000 farms; on each of these farms it would be safe to say there are twenty-five hens; 200,000 times twenty five would make 5,000,000 hens; each hen at a low estimate would lay at least 100 eggs; 5,000,000 times 100 would make 5,000,000,000 eggs or over 40,000,000 dozen; at twelve cents a dozen, would make over \$5,000,000 for eggs produced on the farms. The wool for 1884 at twenty-five cents a pound, was worth \$1,890,678, only \$890,678 more than the value of the eggs. If the fowls had had the same care the sheep had, the difference would have been in favor of the poultry. The value of the eggs was about one fifth of the whole wheat crop for 1885. Over three times as much as the maple sugar, syrup, honey, rye, and barley combined. You say many of the eggs are consumed in the family. So is a share of the wheat, large quantities of maple sugar, syrup, and honey.

But would that more eggs and poultry were used in the families of the farmers, and less pork with its fearful consequences, unless well cooked.

It is said a hen's egg contains more solid food for its bulk than any other natural production of the same size. It costs less to raise a pound of poultry on the farm than a pound of pork.

C. E. Thorne states that three and one-tenth pounds of corn will produce, when fed to a hen, five sixths of a pound of eggs, but five sixths of a pound of pork requires about five pounds of corn for its production. Taking into account the nutriment in each and comparative price of the two on an average, the pork is about three times as costly a food as the egg, while it certainly is less healthful.

A fine flock of poultry adds to the beauty of the farm, the same as does the fine herd of cattle and choice flock of sheep. The farm does not seem complete without these animal pets.

The thought has often occurred to my mind that our friend, Mr. Terry, must have a desolate farm, with no cows, no pigs, no chickens, and nothing but fields of *potatoes, potatoes, potatoes*.

The farmer takes pride in his nicely seeded meadows and well tilled crops, but he has a *warm affection* for these dumb animals, dependent upon him for care and kindness.

Poultry raising on the farm is a health-giving employment, not that there is anything in the mere raising of chickens conducive to health, but it calls you out into the invigorating sunshine and pure air. What if your complexion is a shade darker? Health is one of the best blessings God has given to man. Wealth is nothing compared to it. I have often wondered why more ladies did not engage in the poultry business. The other ranks are all crowded—the

teacher, seamstress, milliner, clerks, etc., while in this enterprise but few have ever engaged. If the same time and energy could be given to this that other vocations demand, poultry-raising would far exceed in profit many others.

Most of the poultry on the farm is raised by the farmers' wives. The farmer has no leisure to devote to such small employment. He sows large fields of wheat and oats; plants many acres of corn and potatoes; has a patch of onions, and here he can employ all his spare time, as well as that of all the boys in the neighborhood. Every year he is growing poorer, times are growing harder, he has less money. He says wheat don't pay the cost of production, and by the time the year comes around, and the hired man and taxes are paid, but little would remain for the farmer and his family, were it not for *the poultry on the farm*..

I believe if the farms now owned in the State of Ohio by 200,000 farmers could become the property of 400,000, she would be worth twice as much in a few years as she is to day.

These farms would be brought to a higher state of cultivation, thereby lessening the cost of production. There would be no waste land to pay taxes on. There would be a time to underdrain the cold, wet fields; time to pay attention to some of the small items, which at the end of the year would amount to a considerable sum, if they could receive proper attention at the right time. Poultry then could be calculated upon as one of the regular sources of a farmer's income; and more than all, the farmer would be less troubled, worried, and perplexed. The farm work would not drive from the beginning of the season to its close; there would be leisure to devote to reading; leisure for social pleasures; and leisure to improve and beautify the old home and surrounding grounds.

From every agricultural community in the land comes the complaint that the boys are leaving the farm. Fathers and mothers ask, "What can we do to keep them?" In my mind there is but one reply: We are all born with an innate desire for possession, to call something our own.

Look at the little child; almost the first word he learns to lip, as he hugs the cherished toy to his breast, is, mine! mine! Herein lies the whole secret. Fathers, give the boys and the girls an opportunity to do something *for themselves*. Get them interested in some branch of industry on the farm; consult their tastes and inclinations, and let their spare hours be employed in some congenial work. If not antagonistic, induce them to try raising poultry. Procure for them a few choice fowls. Let it be understood they are to have the management and care as well as profits. If they do not succeed the first year, have them try again, for if they are ever to be any thing, they must make a beginning, and they must make it, too, by their own tact and perseverance. If they are successful, unless you want to discourage as well as drive them from the farm, don't take one farthing of their earnings, but rather add to it. Let them invest or use as they desire. If their investment should be unfortunate it may prove a useful lesson in after life.

One small boy in Lake county engaged in the poultry business about two years ago, and for the past year has been shipping high class fowls. The work has proved a success financially, and has taken only a part of his hours out of school. He has learned many lessons of patience, and the discipline will be of great value. A young man from the same county told me not long since the annual net income from his hens was about three dollars each. His flock numbers about forty. His fowls are of the light Brahma variety; and by the way, in my opinion, they are the best general purpose fowl. They are quiet and gentle in their habits, and always tame, if kindly treated. I regard it as of the utmost importance in poultry-raising to make friends of your fowls.

Last year a lady, besides attending to her household duties, made two hundred dollars from a flock of thirty hens and five hen turkeys of the bronze variety. These chickens and turkeys were sold for fancy prices, as well as many eggs. Another lady, with an invalid husband, residing on a small farm in an adjoining town, took up poultry raising, thinking it the best of anything she could do at home. She had a flock of fifty hens, and realized from them the first year \$125, the fowls and eggs both being sold at market price.

I am well aware the examples I have just mentioned in regard to the profits of poultry for the farm are not as large as reported in many poultry journals, but these are a few instances that came under my own observation. All who keep poultry may not obtain *these* results, but a farmer should not neglect having some choice breed of fowls, giving them proper care and attention, so that for his own table he may ever have a supply of fresh eggs and poultry. Few farmers realize, who have never kept an account, the income from the poultry on the farm. The poultry and eggs may be the means not only of bringing in quite a large income, but of interesting the boys and girls, especially the latter, and giving them the sense, both of ownership and of responsibility, and thus help to give them a love for farm life and farm animals, and the farm itself.

THE INFLUENCE OF EDUCATION ON FARMERS.

BY A. T. GOORLEY.

[Read at the Morrow County Institute, Iberia, Ohio.]

The subject of education is worthy of far abler minds than mine, covering as it does every field of thought and action, and affecting our destinies both in this world and in the world to come. At the beginning of conscious existence, we find ourselves on an unknown world, surrounded by unknown beings, and by mysterious means of existence, and hurried forward to an unknown future as fast and irresistibly as our great heart-engines can carry us on the destiny laden train of life. Many nations in primitive ages have either perished in the attempt at self-sustenance or died ignorant of themselves and their Creator. Strange as it may seem, the stove by which we warm ourselves is the development of centuries. Every nail in this building is the monument of human greatness, and a history of mental struggles. All agriculture, commerce, system of law and government are the results of long ages of thought, privations and trouble. Now, education gives us access to this accumulated knowledge and experience of our race, teaches us the resources of nature, and how to use our own knowledge and powers.

Complete education has been considered as made up of three parts, physical, mental and moral, or education of the body, the mind, and the soul.

We are necessarily limited to the second, not that we value either of the others the less. As humanity is one, whatever influence education has on any part of the race, it has on the farmers. High, moral and intellectual education has made England and English speaking people the wonder of the world. Germany and France follow in all that is great, while just as illiteracy increases, as in Spain, Greece, Egypt, Turkey, China and India, so influence and power decrease. The same is true of the same nation in different ages. Mental and physical culture made Greece first in war, architecture, painting, sculpture and

literature, and her works remain as models to the present day. *Now* in ignorance and sloth, she lives unconscious of her former greatness, and presents amid vast ruins the greater ruin of neglected minds. The fact that the ancient city of Athens, containing at best only 20,000 free citizens, should still survive in her influence and glory, after 2,500 years of decay, and the other fact that generation after generation of the Adamses and Beechers should be first among Americans, I conceive to have the same explanation; the kind and efficiency of their training, rather than any special bestowal of extraordinary powers of mind.

Thus much in general; and now, to understand properly what influence education has on farmers, it will be necessary to consider the circumstances in which we find them in this nineteenth century, and what is expected of them. This is the age of great monopolies and great competition. Railroads, telegraph lines, manufacturers of iron, of cotton and woolen goods are everywhere consolidating, and as these companies become larger and stronger, so their competition with others becomes more overwhelming. Now, with all these, the farmer certainly does compete. The wool-growers of Ohio have been engaged in a long and losing contest with the manufacturers of woolen goods in the East, on the question of tariff on wool. India, whose laborers receive only ten cents per day, exported no wheat ten years ago, but now send out 250,000,000 bushels, and threaten soon materially to injure our wheat-growers.

Again, as our population doubles every thirty years, it may be some present will live in the United States until it contains 225,000,000. Hitherto the free lands of the West have been a safety-valve to the farmers, in that, instead of endless sub divisions of farms, the young men go West. This cannot continue much longer as nearly all the good soil is taken. After that, either there will be a few men with large farms, or from 15 to 40 acres will constitute a farm, for at any rate this vast population must be supported by our lands. Then we must live with fewer luxuries or must make forty acres produce what one hundred and sixty now does.

Again, upon every man falls the arduous duty of citizenship. The poor, ignorant miner has an equal voice, as far as voting goes, with the college professor. Questions of vital importance are pressing upon us. Soon, whether we will or not, we must deal with such questions as socialism. Every paper is filled with accounts of strikes. The great cities have become a mob terror, an ungovernable mob, and besides these there are a thousand problems in political economy. What assistance have we to carry such burdens? Newspapers and politicians? It is said that newspapers are the great educators. They are, and just as truly are they the great corruptors. Many sheets are overflowing with obscenity. Most of them mix truth and error, misconstrue and bewilder. The same is true of politicians; for example, the "grand old party" last fall proclaimed throughout the length and breadth of our land, that some one hundred and fifty lawful voters were deprived of their rights, and imprisoned in Cincinnati, at the State elections. Congressman Geddes, a pious, respected, praying Methodist, declared in Mt. Gilead that there were only three, and they only by an unavoidable mistake. As it is inconceivable that either Geddes or the Republicans should lie, in this dilemma we are compelled to do as the troubled theologian on predestination and free will, believe both both as great mountains of truth separated only by an unfathomable ocean! No wonder the great Lyman Beecher cried out, "We must educate, we must educate, or we must perish in our prosperity."

These, then, would be what a farmer ought to study after the common branches, viz.: Natural philosophy and mechanics, to fit him to handle his

complicated machinery; history and civil government, to qualify for voting; physiology and hygiene, to protect his health, and chemistry, geology and entomology, that he may increase and protect the productiveness of his land. Until these are mastered, let Latin and Greek remain unstudied. Let the student go on with as many higher studies as he can. They will be a joy and a treasure.

"Oh" but some one says, "education ruins men. Look at the college graduates working by day's work, living from hand to mouth. They are unfit for business, and never will amount to anything." Yes, they are ruined by education. Ruined by education? What ruined the loafer who can scarcely read? Did education ruin him, or was he capable of ruin? Did he ever have any character or ambition, or was he born ruined? It is high time this bogus wisdom be laid away with the nonsense about witches and the moon. The moon is not made of green cheese, nor does a judicious education ruin men. If the great mass of humanity, by the most rigid economy, by cruel self-denial, never possessing any of the pleasures or refinements of books or music, and few of the good things of this world, acquire only a small home, why should a graduate, whose financial standing at the end of his life is no better, be branded as a failure? Nay, more, I will venture the assertion that the percentage of educated men who are worth \$20,000 is far greater than the percentage of men who have not passed beyond the three "R's," and having acquired that sum, I am well aware that far too much time has been spent on some things, but to say that the man who understands the government of which he is a part, machinery, the properties of soil, and has a mind trained to thought, is disqualified for farming, I hold to be the veriest nonsense.

What is success in life? To get rich? So it seems the great mass of men think, and within certain limits it is true? Still, I had rather be a poor American, than a rich Chinese, or an Indian nabob. I had rather be a Wendell Phillips than a Wm. H. Vanderbilt. What though Robert Fulton spent, what seemed entirely too much time on his steamboat, or Benjamin Franklin on electricity? They blessed humanity. The ocean is crossed in seven days, and midnight shines with electric suns. One hundred and fifty years ago but few could read. Then, for petroleum, farmers had the tallow dip; for separators, the flail; for harvesters, sickles; for window-panes, greased paper; for palace cars, lumber wagons; and for fine clothes, homespun. Great as have been the improvements, nature is still unexhausted. People have just found out that they are surrounded by the Almighty. The air, the water, and the soil are full of wonders and forces which will yet be discovered and alleviate the condition of man.

"O, yes," says one, "this will do well enough for a dreamer, or for a gentleman farmer; *we* haven't time; we have our crops, our hogs, and our horses to care for, and we can't prepare our boys." O you are so busy shoveling dirt; you can't pick up nuggets of gold out of the shovel. Well, now, most of you can spare your boys, and if so inclined, you can yet become proficient in those studies which I have named, yourselves. For what purpose are rainy days, and long winter evenings? To read stories, or talk scared? May be; but I think there is a better way. You don't hesitate to pay \$25 per year for tobacco, to buy a new carpet, or a new buggy, but who in all this country has bought \$25 worth of books per year, for two years? Many of the best books of the world can be bought in cloth at from \$1.00 to \$1.50 per thousand pages; \$200 then will buy a library of at least 100,000 pages, which, if well chosen, will well represent every department of knowledge. Your buggy will last ten years, your library your life time, and many of the books will be read by your great grand children. "Well," but says some one, "what do

you want of so many books? You can't read them all." No, nor you can't use up all the iron in your hatchet, nor all the steel that's in your razor. Neither will you use them every day, but when you want them you use them and lay them away.

In this connection, I will recall a saying of Macauley, that "were he offered a kingdom, and not be allowed books or to own but one small room, and that well filled with books, he would not be a king."

Nay, more, if you will look around you will find that many men who work night and day by some means know more about politics, general news, finance and other useful knowledge, than those who have far more leisure. It has been done by carefully using their spare moments. The truth is the man who has no time for self improvement now, would not have time had he nothing to do but eat.

So far this subject has been viewed only from its lowest standpoint, in its coldest and most practical aspect. In other words, how much it will help to prosper financially. There is another, and far higher way to consider it. The pursuit of knowledge is its own reward, one of the highest of earthly rewards. No man can suffer long with a sense of lowliness, who converses with the great and good of all ages. The infinite variety of colors and outlines, of crystalization, of the powers and forces of nature, of the feelings and experience of mankind, are worthy of much study, should they never repay the investigator a penny. Macauley uses the following beautiful illustration of a similar subject: "The dervish in the Arabian tale did not hesitate to abandon to his comrades the camels with their loads of jewels and gold, while he retained the caiket of that mysterious juice which enabled him to behold at one glance all the hidden riches of the universe. Surely, it is no exaggeration to say that no external advantage is to be compared with that purification of the intellectual eye, which gives us to contemplate the infinite wealth of the world, all the hoarded treasures of its primeval dynasties, all the shapeless area of its unexplored mines."

Much then, friends, as you love education, love it still more.

"Doubtless in these neglected country spots are hid,
 Hearts that are pregnant with celestial fire,
 Hands that the rod of empire still shall sway,
 Or wake to ecstasy the living lyre."

From our farms will yet rise other Cromwells, and Washingtons, and Lincolns, and Garfields.

CURIOSITY AS AN INCENTIVE TO SUCCESS.

BY F. W. MURLIN.

[Read at the Mercer County Institute, Mendon, Ohio.]

As applied to the human mind, our subject means great inquisitiveness, the power of investigating, inquiring into, a disposition to know the "whys and wherefores," "reasoning from cause to effect."

I have somewhere read that "the wisdom of the wisest creature God has made ends in wonder." There is no age, condition, or avocation in life but what this element will manifest itself, and whether fully or only slightly aroused,

it has the peculiar power of awakening a man's better or worse nature, which ever may have control of the man.

Let us examine a few cases and notice the peculiar manner in which this curiosity has manifested itself in each of the characters referred to.

Galileo, one day standing in the cathedral at Pisa saw one of the chandeliers swaying to and fro. His curiosity was at once aroused, and he said, "I'll think of it;" he did so, and his investigation evolved the pendulum.

John Guttenberg was the inventor of the art of printing by the application of movable wooden type, and because it was in advance of the age in which he lived, he was thought to be possessed of the devil, and was persecuted accordingly; but this outbreak of curiosity has been preserved and improved upon, until now it is a power that sways the world at will.

Sir Isaac Newton, one day seated in his garden, saw an apple fall to the ground. His curiosity was aroused to know why the apple did not ascend, fly off in a tangent, or go in any other direction, or why it fell at all. He, also, said, "I'll think of it." His mind unraveled the mysteries of the laws of gravitation, and showed how the earth, moon, and stars are each kept in their places, and why bodies unsupported will fall to the ground.

James Watt invented the first successful steam engine, the idea being suggested to him while seated in his mother's modest and humble kitchen watching the tea-kettle, which was partly filled with boiling water, that generated steam of sufficient quantity and power to lift the lid.

Benjamin Franklin was curious to know if one of the fiery, untaught elements of nature could not be made to subserve the interests of man. His efforts were a success, and I need not stop here to enumerate the manifold blessings that have emanated from this development of curiosity. (Lightning rod agents will testify to this every where.)

Eli Whitney, a young man of culture and refinement, was visiting a friend in the State of Georgia, where he saw that one of the greatest natural products of that country was rendered almost valueless on account of the prodigious deal of labor which it took to render it fit for use. He put his curiosity to work at it, and to-day we are indebted to this single manifestation of this faculty of mind for very much of our clothing and dry goods, besides the many other ways in which the cotton gin has made this single staple of incalculable value.

Robert Fulton, an American engineer, sought to expedite commerce and travel by utilizing the great expanse of waters. and as a product of his curiosity, we have steam navigation, and our commercial centers, our seaport towns, with their many industries, all attest the merits of this outburst of curiosity, and as Robert Fulton's invention was utilizing the great water ways of the continent in facilitating travel and commerce, so some one's curiosity was stirred up to know if the land areas could not be used to the same advantage. It needed but the prodigious effort of mind of a George Stephenson to invent a locomotive and project a railway system, and at the present time we have in the United States alone railways enough to reach more than three times around the earth, besides the railways of Europe, Asia, Africa, and South America.

Our great coal mines were, for a long time, an enigma, because of the danger of explosions from working in them with the non-safety lamp. Sir Humphrey Davy, a celebrated chemist, sought to allay this danger, and his curiosity wrought out the safety lamp.

L. J. M. Daguerre was the inventor of daguerreotyping. We have not time to elaborate any farther on the inventors of all ages, but a mention of a few more of them with their invention must suffice.

Archimedes was the inventor of the hydraulic screw, a spiral pump, and

said that, with a lever, he could lift the earth if a place for his fulcrum and standing room could be obtained. Richard Arkwright of the spinning frame. Elias Howe of the sewing-machine. Charles Goodyear of vulcanized India rubber. Horace Wells of ether or nitrous oxyd. McCormick of the reaper. Ericson of the Monitor. Colt of the revolver, etc.

These all show that their curiosity was exerted in favor of the happiness of the age in which they lived and of the ages to follow.

We will now notice briefly the manifestation of this element in another form. Take the literary and scientific circle, and see what the curiosity of those in it has done for the world.

Our own curiosity has led us to inquire who may become great, and after some considerable research, we are led to think it is within the reach of any young man or woman to reach a much higher eminence than the mediocrity in which so many of us exist. There is no young man of good, hard sense—no difference how limited his financial resources, but may, by dint of effort, reach a much higher plane than a local reputation, which is good as far as it goes, but it doesn't reach as far as it ought to.

As this is a farmers' meeting, and I notice a great farmers' boys in the audience, let us, for their encouragement, say a few words to them. A recent writer has taken the pains to gather facts concerning a large per cent. of our eminent and successful men. His curiosity has revealed the fact that by asking this question, "Was your boyhood up to fourteen years of age spent in the country, in a village, or in the city?" A *very large majority* of our famous men were farmers' boys, inured to penury, poverty, and toil.

He also finds by the answer to this question, that only forty seven per cent. of our population of working age reside in the country districts, but they furnish fifty-seven per cent. of our successful men, while the cities with twenty per cent. of the population, furnish seventeen per cent. As the cities fall three per cent. below their quota, and the country ten per cent. above their ratio, it appears that the country averages thirteen per cent. above the cities in the proportion of its boys who become eminently successful. He also says that very few of the prominent men of New York City were born in the city. A great majority came from the country.

Rev. Washington Gladden found out by personal investigation (the result of curiosity) that nearly all the leading men of Springfield were country born and bred. Even in Boston, considered the place of all the world to be born in, a large majority of the leading merchants and professional men came from the country. (John L. Sullivan is probably one of the exceptions)

The first conclusion from these facts is that a man who wishes to succeed should select a country farm for his birth place, and thus enroll himself among such illustrious farmer boys as Senator Edmunds, John A. Logan, General Howard, A. H. Stephens, Anthony Comstock, Orange Judd, J. J. Astor, Elihu Burritt, John Wannamaker, Lewis Miller, Jacob Esty, W. E. Dodge, D. L. Moody, Joseph Cook, and Martin Henry Dexter.

A country environment of pure air, plain food, regular out door work, early sleep, freedom from cigarettes and saloons gives the farmer boy an advantage of thirteen per cent., when in young manhood he comes to the city to enter upon a commercial or professional life.

Above all, boys, have a definite aim, a set purpose, and march steadily onward; be in earnest, for we are taught that "fortune seldom favors fools." "Folly and fortune are not long in partnership." Recollect that poverty is no disgrace. Indeed, it is said that a moderate allowance of poverty is a favoring environment of boyhood. It was the trainer of Girard, Stewart, Astor, and the elder Cornelius Vanderbilt. Seventy-three per cent. of our

successful men belonged to families so poor that they had to work most of the time out of school hours, which to these boys were generally few.

ThurLOW Weed was so poor in boyhood that on a cold March morning he had to wrap his feet in pieces of cloth in place of socks and shoes; thus clad he walked several miles to borrow a history of the Reformation. Luxury raises few such men, but many a "barefoot boy" has climbed the ladder of success by such energy and honesty, and thus paved his way to glory and immortality.

Nelson W. Aldrich, a Rhode Island Senator, entered the city of Providence in the same modest manner that the illustrious Whittington entered London, or Benjamin Franklin into Philadelphia, or Horace Greely into New York—on foot with their clothes slung over their back. Benjamin Franklin, when a boy, went without bread that he might buy books. Elihu Burritt is another typical child of poverty. At eighteen he was a blacksmith's apprentice. He was a farmer's son; the youngest of ten children. At thirty years of age he had learned all the languages of Europe and several of Asia. He was offered a course in Harvard College by Gov. Everett, but he replied that he preferred to work while he studied (as had been his custom). He died recently at the age of sixty-eight, beloved by the people of two hemispheres.

Hence, we see that where there is a *will* to be good and great, there is always a *way*. The habit of *early industry* is even more powerful than a country environment in preparing a boy for the hard work of winning success, as may be seen from the fact that, while only fifty seven per cent. of the successful men come from the country, seventy-three per cent. of them, including many of the village and city boys, were accustomed to regular work out of school hours.

The *Atlanta Constitution* recently described four of its newsboys, "brothers in blood and pluck," whose early habits of industry have insured their success.

"These four boys started a few years ago selling newspapers. They made ten cents apiece the first morning they went to work, but instead of spending it for cigarettes or something else equally hurtful, they laid it by, and for two winters thereafter went barefooted through the snow and sleet in the freezing dawn in their morning rounds. They endeavored from the very first to save a certain per cent. of their earnings, which they invested in Atlanta real estate. The eldest is now eighteen years of age; the youngest twelve, and during this time they supported an invalid father and their mother, and have accumulated more than \$5,000—houses from which the rent is twenty dollars per month, besides two hundred dollars stock in a building and loan association. They have educated themselves meanwhile, staying out of school one year that they might work the harder and build a house for their parents."

While these boys were probably reared in the city, we quote this example as showing what these boys have done, other boys—whether of city or country breeding—may do the same, and it must be done, too, in about the same manner, by early *habits of industry and economy*.

The whole secret of their success, which was steadiness, sobriety, industry, and economy, must be learned by you. There are few lessons of more importance to boys than that the smallest income—no matter how small—will make a man independent if he will only live inside of it, and compound his surplus. A New York merchant predicating upon poverty and expiating upon its advantages in boyhood, said: "I believe one frightful cause of injury to young men of good standing in society is the lavish amount of pocket money their parents allow them when they are boys."

The lamented Garfield said: "Poverty is uncomfortable, as I can testify, but nine times out of ten the best thing that can happen a young man is to be tossed overboard and compelled to sink or swim for himself."

In all my acquaintance I never knew a man to drown who was worth the saving. It is the pride of every American that many cherished names at whose mention our hearts beat with a quicker bound, were worn by the sons who conquered obscurity and became fixed stars of our firmament. There is no horizontal stratification in this country like the rocks of the earth, that holds one class down below forever more, and lets another come to the top to stay there forever. Our stratification is like the ocean, where every individual drop is free to move, and where from the sterner depths of the mighty deep any drop may come up to glitter on the highest wave that rolls.

We will mention a case that came under our own observation. A brother and sister, at one time pupils of the writer, whose parents, while not poverty stricken, yet had to struggle to keep the wolf from the door. They were not used to the luxuries of their more fortunate school mates, and not unfrequently were they laughed at on account of their plain food and still plainer wearing apparel, and once the teacher's interference saved a riot in the school, occasioned by some unsavory remarks made by some of the more fortunate pupils in reference to these unfortunate ones. But to-day one of those pupils is overseer in a sanitarium or health retreat in one of our cities; the other is a book-keeper in a large wholesale establishment in one of our great inland sea-port towns of the West.

NOTE.—The following offer of a prize for best essay on butter making was made by the Board of Agriculture in its Premium List of 1885:

BEST ESSAY ON BUTTER-MAKING IN PRIVATE DAIRIES—\$25.

For the best essay, giving full and explicit instructions and suggestions, by which the butter made in private dairies may be made of uniformly good quality, like the best "gilt edge" butter of the creameries. The object is to secure a better grade of butter in our private dairies, which really makes the bulk of the butter in Ohio, and at present of a very low average grade, and bringing a low average price compared with the best creamery butter.

Four essays were submitted and referred to a committee of the Board. This report is as follows:

REPORT OF COMMITTEE ON ESSAYS.

The Committee on Essays beg leave to make the following report: Four essays on butter making were offered for our consideration, and all of them contained much useful, practical information, and fairly filled, in letter and spirit, the requirements of the premium offered. After due consideration, we have awarded the premium to Mrs. N. L. Smith, of Lindenville, Ohio, but commend especial attention to Mr. Geo. L. Stanley's essay for its thorough instruction in the manufacture of farm dairy butter, combining in our judgment the best rules for its manufacture, and describing the best implements. Those recommended by him ought, in our opinion, to be generally adopted. We further recommend that all the essays be published in the annual report, in order that their different points of excellence may be made known.

[Signed]

WM. C. LEVERING,
J. H. BRIGHAM,
HENRY TALCOTT,

Committee.

PRIZE ESSAY ON BUTTER-MAKING.

BY MRS. N. L. SMITH, LINDENVILLE, O.

The first essential in making good butter is good cows. Good butter may be made from any *breed* of cows, but there are some individual cows that no one can make good butter from. I prefer the Jersey, as a breed, because they give rich, fine flavored milk, which makes fine, yellow butter. The cream globulars are large, and rise to the surface quicker than they do in the milk of some other breeds of cows. The cows should have, in May and June, in addition to good, tame pasture grass, a feed twice per day, from three to four quarts of provender, composed of corn, one part; oats, two parts; or, in addition, bran three parts; middlings, two parts; oil meal, one part. This will make an excellent feed for late in the summer, when the pasture begins to fail in July and August. The best substitute for grass is drilled corn (sweet), as it yields more per acre than anything else we have ever used to bridge over the dry weather of July and August. If the weather is dry in May, the best feed is green rye. It is impossible to make a first class article of butter through the dry weather without some green feed to lengthen out the pasture. Without it the cows will roam around without any time to rest, and the milk become more or less feverish. Never use a dog to drive up cows. The milking should be done as carefully and rapidly as possible, without exciting the cows by seeming to be in an unusual hurry. The milker should seat himself close to the cows, take the pail between his knees, and take the teat gently in the hand, use the whole hand at the same time, pressing gently upwards against the udder. Milk rapidly, and take it clean without delay. Be sure your pail is large enough to hold the whole of the milk, so there shall be no delay in emptying before the cow is milked clean. Before beginning to milk, the udder should be brushed off clean, and dampened with a damp sponge to prevent the possibility of any dust falling into the pail. After the milk is drawn from the cow, it should be taken directly to the creamery, (here I might give a description of a creamery, but it would be too lengthy for this essay), and strained in the cans or pans, and cooled down as quickly as possible to 45° or 48°. I think the cans preferable, as they are less trouble, easier cleaned, and make much nicer butter. The cream rises to the surface quicker in a falling temperature of the milk than it does in a stationary one, and it rises all the quicker within limits the more rapidly the milk is cooled. Let it set in deep-setting cans twelve hours, or in shallow pans twenty-four hours or until slightly acid. In skimming the cream from the milk, if done by the skimmer or separated as in the deep setting process, it is well to gather a little of the skim milk with it, as it is an advantage in the operation of the churning. Skim your cream in tin cans large enough to contain an entire churning. Have them made a little flaring at the top as they are more easily kept sweet and clean, and light to handle. Two of these are needed. Stir the cream frequently while ripening; keep it where it will have extra warmth of from 65° to 70°, or when only a small quantity of cream is obtained daily, keep it as cold as possible until enough is obtained for a churning, then give it extra heat, and ripen rapidly as possible, stirring occasionally. then cool down to from 62° to 64° in winter, in warm weather from 58° to 60°.

The care of the churn is an important matter. Any want of cleanliness or care will quickly communicate an unpleasant flavor to the cream, and, of course, to the butter. After using the churn, it should be thoroughly washed

and cleansed with scalding water, and afterward rinsed with pure cold water, and then dried and aired. In preparing the churn for the reception of the cream, scald thoroughly; in summer, rinse well with cold, pure spring or ice water. If in cold weather, heat the churn thoroughly with hot water until it is hot clear through. The temperature of the churn is quite as important as that of the cream. In churning, the motion should neither be too fast nor too slow, but a uniform speed throughout the operation; if a revolving churn is used, about 40 to 45 revolutions per minute. When granules are observed about like wheat kernels, the churn may be stopped. A great convenience for observing this is a piece of glass set in the lid. The buttermilk may now be drawn off through a hair sieve. A few quarts of brine may now be used, made of clear, cold water, and the best of salt; repeat this until the water that runs off looks as clear as when poured on. The separation of the buttermilk while in this granular condition is thus most perfectly accomplished. The appearance is then like a mass of small pellets or wheat kernels of the most beautiful golden color, and with its purity will hold its flavor for a long time. When the butter is thoroughly washed, and still in a granular state, carefully take out the butter and weigh it. Use the purest quality of salt. Sprinkle evenly one ounce of salt to the pound, work it enough to work salt in thoroughly. Care must be taken not to work the salt out (for I firmly believe salt to be a preservative). The working should all be done by the roller process, and direct pressure, under no circumstances permitting a sliding or cutting motion, as the aim should be to retain the brine throughout the mass of butter to flavor and preserve it.

The form in which this shall now be sent to market is a very important consideration. If to be sent to a distant market, neat tubs made of ash or oak, holding from 25 to 30 pounds, are undoubtedly the best. The tubs should be thoroughly soaked in strong brine. If marketing near home, small stone jars holding two gallons are preferable. The butter should be packed (a little at a time) firm and solid to prevent air cells. If your trade requires your butter to be in rolls or prints, wrap each roll or print in bleached sacking (don't use old rags because they are clean and white) and pack in neat boxes.

These points strictly observed will give butter good enough to set before the Queen.

COMMENDED ESSAYS.

FARM DAIRY BUTTER.

BY GEO. L. STANLEY, ROME, O.

[Specially commended by the Committee of Awards.]

How we can be remunerated for our labor in butter-making is what concerns every farmer and his wife. The answer is make the best quality and sell on its merits under your own brand. This essay will give the writers methods of doing both.

The first thing is to make a strictly prime article, and in order to do this uniformly good apparatus throughout, including cows, stables and feed, will be a prime necessity.

A mother with gray hairs, who had often received from two to three cents per pound more for her butter than was paid others, commenced making butter with an improved creamery apparatus in the spring of 1885. She stated to the writer that she thought she could make good butter by following the methods taught her by her mother, but she had discovered the fact that she could make butter with better keeping qualities by using the creamery and other improved apparatus.

As creamery butter is the grade that sells highest upon market, the aim of the dairymen should be to manufacture an article of quality and color of creamery butter. To accomplish this, farm dairymen cannot depend merely upon such authorities as Arnold and Willard, for the reason that their books were written before farmers had to compete with imitation butter, and before much of the apparatus in use now was invented or had come into general use. Consequently, they give no directions for overcoming many of the difficulties which the dairymen now have to contend with.

The following directions are given for the use of the average farmer, and are the result of an experience of about twelve years in butter-making alone, with a creamery, upon a farm from a dairy of from ten to twenty cows. During these twelve years different methods and apparatus have been tried, and it is without any hesitancy the following directions and apparatus are confidently recommended as reliable for making good-keeping butter with the least labor, and in the shortest time; but by careful study of the directions the dairymen can improve with any apparatus, although to be the most successful in the results, it will repay the farmer for investing in a first class apparatus.

If any who may read the directions think they can make fine butter without being so particular as the directions indicate, I would like to have them carefully follow the directions for a few churnings, and note the results of yield and quality, and then for a few churnings vary the temperatures at different stages of raising the cream, churning and working. I am confident it will take only one trial to satisfy even the most incredulous that they cannot afford to do otherwise than to carefully follow the directions.

Those we have to compete with—creamerymen and manufacturers of imitation butter—have made it a carefully studied science, and to successfully compete with them the farmer must do the same.

DIRECTIONS FOR MAKING FARM DAIRY BUTTER.

The cows' bags and teats when dirty should be washed with warm water, as dirt in the milk pail will show itself in the cream. For straining, cut a piece of cheese-capping the same length as the width of the bolt, and fold it so as to be four thicknesses. Use it alone in the summer, and in the fall, winter and spring, place under the cheese capping a single piece of cotton cloth, a little finer than the cheese capping which will make the milk run slower so that but little dirt will show itself on the cream. If the milk is strained in pans, the strainer can be fastened with clothes pins either to the pans or a frame to be set on the pans, and it can be tied to the cans with a string.

If butter alone is to be made from the milk, it should be kept at a temperature of from 60° to 62° in weather that is cooler than 60°, and from 58° to 60° in warm weather. If the milk is set in pans, it should be covered as soon as it is cooled so as to keep from dust and the warm air. The cream should be immediately taken off the milk as soon as it commences to sour, and salt at the rate of a small handful—say, three ounces—to the gallon, stirred in thoroughly, which retards the fermentation. Set the cream away in a deep can. Stir often, and add salt in proportion to the cream added. The salting and frequent stirring will prevent there being any white specks in the butter. Do not allow the cream to stand longer than

twelve hours without stirring, and keep the temperature below 60°. Probably the best method most farmers can devise for keeping cream is to sink a large meat jar below the cellar bottom and keep the cream can in it, covering the jar tightly so as to keep out warm air.

The churning should be done as often as once in two days or oftener in warm weather, and in the winter the condition of the cream will lead the dairymen to know when to churn; but great care will have to be exercised in both summer and winter, or the fermentation will get so far advanced that good-keeping butter cannot be made from the cream. As a rule, cream should be churned as soon as possible after it sours, but if it is kept at a temperature below 60° while on the milk, and after it is skimmed, and by using salt and stirring often it can be kept 36 hours, and yet make good-keeping butter.

The kind of churn used should be one that will churn from five pounds to the full capacity of the churn, so that the cream can be churned at the proper time. The revolving churn has combined advantages for churning at any time, as well as for washing, salting and working butter, so that when properly managed the butter can be taken from the churn ready for packing, which lessens the work after the butter separates from the milk fully one half, and the butter will keep longer than in the usual way of cooling, and dissolving the salt preparatory to a second working.

The churning should be done as early in the morning as is possible in warm weather. Wet the churn with warm water, and thoroughly cool with cold water just before putting the cream in. The temperature, to commence churning the cream, will depend upon the surrounding temperature while churning. If the churn is thoroughly cooled, and the temperature of the room is below 60°, the temperature to commence the churning should be 62°. If the temperature of the room is from 65° to 70°, the churning should be commenced at 60°, and if the room is warmer than 70°, the temperature of the cream should be 58° at the commencement of the churning. In short, the right rule is for the buttermilk not to be warmer than 62° at the time of the separation of the butter from the milk. If it is warmer than 62° there will not be so large a yield of butter. Warm the cream either by setting the cream can or the cream into a tin pail in a pan of hot water. Slide the thermometer scale down far enough so that the mercury will be immersed in the cream. Hold it in the cream with one hand, and stir the cream with the other hand until the mercury registers two degrees below the right temperature to commence churning. Immediately remove from the water, and the heat of the tin will usually heat to the right temperature. Cream should always be stirred while warming, as it will make the butter have an oily and bad appearance for any portion of it to get too warm. Strain through a wire gauge or perforated tin strainer into the churn. In late fall, winter and spring, color with Wells' and Reichardson's improved butter color, according to directions on the bottles. The capacity of any churn is one half full. If more than that is churned at a time, it will take too long to churn the cream to be profitable, but the yield will be increased somewhat. A glass panel in one of the staves of the churn will enable the operator to see, at any stage of the churning, how it progresses without opening the churn, and it is an indispensable help the dairymen will find after using it, and half an hour's time and the expense of twenty-five cents will put one into a churn.

When the butter begins to separate from the milk, try the temperature of the cream. If it is 62°, put in half a pailfull of cold water, and a handfull of salt. If it is warmer than 62°, a pailfull and two handfull of salt can be used to advantage. The effect of the salt and chilling makes a more thorough

separation of the butter from the milk. It will be longer gathering but the yield will be considerably increased thereby. There will not be a complete separation until the glass panel washes off clean of the cream which should be the operator's test as to when it is gathered enough to run off the buttermilk. The globules at that stage of the churning will be about the size of kernels of wheat and the butter should not be allowed to gather in globules larger than kernels of corn while washing the butter. Wash the butter by putting in two handfull of salt to each pail of cold water, and strain the water so as to keep all specks and dirt from the butter. The amount of water at a time should be according to the probable amount of butter, a pailfull to each ten pounds of butter, and turn the churn a few times around, but draw off immediately after churning the water in the butter, as it has a tendency to whiten the butter by standing in water. It has been stated by some writers that the salt overcomes the tendency to a certain extent, but the most useful effect of the salt in the cream and water is that it makes the liquids heavier, and, consequently, a more complete separation takes place which increases the yield and keeping qualities of the butter.

The butter should be washed until the water drawn off is only slightly discolored with the milk, and the butter is chilled as cold as cold well water will chill it. If the butter is to be finished upon a butter-worker, the churn, after the last water is drawn off, should be turned until the butter is gathered to about the size of kernels of corn, and then carefully drain off the water, and after weighing salt in the churn at the rate of one ounce of salt to the pound of butter, and slowly turn the churn until the butter is gathered to about the size of walnuts or small apples. Then, immediately empty on to the butter worker, and carefully work so as to thoroughly mix the butter together until the salt is evenly mixed, and the butter will be ready for packing without a second working. In order to accomplish this result, it is necessary to use the fine ground American salt, as it will dissolve quicker, which will lessen the tendency to white streaks in the butter. To work the butter in the churn, warm the last water to 60°, and churn long enough to warm the butter a little, then turn the churn until the globules are about the size of hickory nuts. Drain off the water, weigh and salt about seven-eighths of an ounce to the pound. After turning a few times around, draw off the brine, then slowly turn the churn until the butter is gathered into a mass, and the butter is ready for packing without more working than will be done in packing. The buttermilk and brine will be about what the cows need for salt.

The kind of butter-worker best adapted to the use of the dairymen is undoubtedly Rend's flated roll worker, on account of the operators being able to so quickly work and handle the butter that it will be properly mixed before heat in the summer or cold in the winter can be troublesome. It takes up but little room, and can be used in a warm room where the above directions are followed. When not in use, it should be washed and sprinkled with salt while damp, then cover with a wet cloth, and it will not mold or dry so as to be troublesome about the butter sticking when using. To prepare the worker for use, wet every part with warm water, and cool with cold water just before using.

Pack the butter in new oak packages, previously soaked in water with two handfull of salt dissolved in it, which keeps the tub from drawing the salt from the butter. Pack to within one-fourth of an inch of the top of the tub. Place on top a cloth, and fill to the top of the package with salt. Mark plainly the weights on the top, and if shipped to a commission house if possible use a stencil for marking. The size of the package used should depend upon how long a time it will take to fill it, as the butter will vary too much in

flavor if the dairymen is longer than a week or ten days in filling it. Probably in small dairies, crocks are the most suitable for packages, especially where the butter is marketed direct to consumers.

I am aware of the fact that few dairymen think it improves butter to wash it, but that it takes away the buttermilk flavor, which is prized by the farmer. The flavor of the butter is worse instead of better when the fermentation reaches a certain stage, where the buttermilk is not washed out. The best proof that we have that better-keeping butter can be made by washing with water, is that creamery men wash their butter, and as that style of butter sells highest upon market, the dairymen should imitate it in every respect, as far as possible, for the reason that it is the kind of butter most sought for upon markets, and in imitating it, the dairymen will make an article that will bring a price within two or three cents of the best creamery butter, which now would be almost an impossibility by following the old methods of making butter. If dairymen were united in following creamery methods, and would be careful not to market any but fine butter, imitation butter would soon be sold in its component parts separately, as it should be. Manufacturers of imitation butter cannot sell their goods when fine butter is to be bought that is known to be good butter; so it is, without doubt, a fact that farmers can themselves regulate the sale of imitation butter nearly as well as legislators, though the latter should forbid the bogus to be sold as genuine.

It will be noticed that the directions are more especially for dairies where the milk is set in pans. Some additional directions are necessary for the benefit of dairymen who make butter alone. Where the cream is taken from the milk sweet, the salt should not be stirred in until it ripens or commences to sour. The cream and butter, in all other respects, should be treated the same, excepting where the butter made in the private dairy is of the same quality in every respect as creamery butter. The farmer is justified in marking with a stencil plate the packages, "fancy creamery butter," and can expect creamery prices for it. The deep setting system is taking the lead, and probably the cabinet creameries will have the preference in the future on account of so much handling of the milk being saved. As already intimated the barrel churn will take the lead on account of its adaptability and requiring so little power to run it.

The expense of a barrel churn, Reid butter worker, and a proper place to keep cream and butter will be from ten to twenty dollars, according to the size of the dairy; and by carefully marketing his butter, the dairyman will sell his butter for enough more the first year to pay the cost, and if the apparatus is well cared for, it will last a lifetime. The price of creameries varies, and can be ascertained by addressing the agents or manufacturers.

The impression the writer would like to leave is that there is no investment the farmer can better afford to make than that in a first-class apparatus for butter-making, and that at this age the dairyman cannot receive proper remuneration for his labors unless he carefully makes butter by following the most approved methods.

Market as soon as possible after the butter is properly cooled. The mistake many farmers make is in keeping summer butter and marketing it in the fall. Eight or ten years ago, which was before the production of so large an amount of creamery in the Western States, and before imitation butter was bought in preference to poor dairy butter, even June butter could be held and marketed to advantage in the fall of the year, and often there would be a gain of from three to five cents per pound realized. June butter, marketed in September, 1885, would most of it undoubtedly have been sold for grease, and even July and much of August butter sold in September would have been sold at less than if it had been marketed soon after it was manufactured. During the last

five years many dealers who have held creamery butter in cold storage have lost large amounts of money; consequently, dairymen cannot afford to hold their butter until there is better demand for their butter than there has been for several years. The experience of dealers and shippers during the five years, as a rule, has been that the sooner their goods have been sold after being manufactured the higher price they have received.

ESSAY ON BUTTER-MAKING IN A PRIVATE DAIRY.

BY MRS. H. A. CANFIELD, TEDROW, OHIO.

[Recommended for publication by the Committee of Awards.]

Having lived all my married life, forty-seven years, on a farm, and having always every year made butter from the milk of from six to fourteen cows, with excellent success and great uniformity in quality of product, I will give my method. It may not differ essentially from the practice of many others, but there may be some hint that will be useful to others. It is a noted fact that there is a great deal of poor, inferior butter thrown upon the market, and the question arises, Why is it? I answer, carelessness and inattention to what are sometimes termed little things. They let the milk stand too long before skimming, or the cream stand too long before churning, or it is too warm and the butter is white and soft, or it stands too long before being worked and packed, or isn't half worked, and a great deal of buttermilk left in, salted too much or too little, any one of which is injurious to the production of a fine article. We read that it is the "little foxes that spoil the vines;" consequently, if we want to make a good article that will command a good price, we must pay strict attention to these little things, allowing no other household duty to take precedence where it can be avoided. Skimming the milk, preparing the cream for the churn, salting, working, and packing the butter, I always prefer to do myself, seldom trusting it to others. Enough on this point.

The first requisite in the keeping of a good dairy is keeping good cows; those that give rich milk, that will make yellow butter; none other should be tolerated on the farm unless you patronize a cheese factory. Give them good, sweet pasture, and plenty of it. In the second place, perfect cleanliness in the milking as well as in every other part of the work should be insisted on. I consider it just as uncleanly to milk in the morning with unwashed hands as to get breakfast with them unwashed. Brush off all loose dirt from their udders, and if necessary wash and wipe. A small pail of water in the hand, and a towel over the arm is but little trouble when you go out to milk; then the cows milk easier for the washing. If not wiped, the dirty water will trickle from between the fingers into the milk; such filth won't strain out, either. Use the finest of wire strainers, and to my mind the finest is not fine enough. A nice way is to make a bag of some linen or crush toweling; make it two inches wider than your strainer, slip a light frame in it, similar to a slate frame, put in a pin to hold the two open edges together, and lay over the strainer, pressing the center down a little. This will strain the milk much cleaner.

Next, you want a good place to set your milk if you haven't a creamery. I have movable slat shelves made of $1\frac{1}{4}$ -inch stuff, sawed in strips so they are

square. Three of these to a shelf, kept in place by inch-wide slats, one across each end, and one in centre. Uprights are $1\frac{1}{2}$ inch thick, with grooves for the shelves, the upper and lower ones dove-tailed for plain shelves to keep from spreading. These in summer are set up in the cellar, out away from the wall, and where it is light, with a table close by. I use six quart pans, filling them quite full, unless the weather is very warm. My cellar is quite cool, and we take pains to keep it so. A window on north, east and west sides each are plenty; if there is one on the south side, you should close it. To each window I attach in summer a short curtain, which I am careful to close every morning before the sun and hot air can get in; at night I slide them clear back, letting in all the cool night air possible. With wire screens in the windows, and a small one in the door, with a curtain also, the heat can be kept out for a long time. If you have ice plenty, keep some in a pan where it will slowly dissolve, on the top shelf, and it will aid materially in cooling the atmosphere. Milk, under ordinary circumstances, can stand 36 hours in summer, and 48 hours in winter before skimming. If it becomes thick, it does not matter; only skim as soon as it becomes solid enough to take off nicely. Put cream in stone jars on cellar bottom, stirring up from bottom every time more is added. When kept at a low temperature, every third or fourth day is often enough to churn in summer, and once a week in winter. Put cream altogether the night before you wish to churn. If the weather is warm very early in the morning, try it with a thermometer, and if above 62° , set it in a large vessel of cold water, adding ice if you have it, not adding the morning's skimmings unless it has got to stand two or three hours before churning. If you do, mix it well, but nearly all the sweet cream you add will be lost in the buttermilk. I am not particular about the kind of churn, only soak it well in cold water. I have been using the Blanchard, now Wilson's barrel churn,—both are good,—and tin dash churn in winter, that can be set in hot or cold water, as desired. Churn steadily, not too fast, putting down cream once or twice after it shows signs of coming. When nearly gathered, rinse down with a dipper of cold water, work the crank back and forth gently until sufficiently gathered to draw off the buttermilk, or put into the butter bowl which has been soaked in cold water while the churning was done. Put on cold water, work it a little, and drain off. Then make two or three quarts of strong brine,—common salt will do, only pour off the scum that rises,—put in a part, work or wash the butter in it, then pour off; now add the rest, make openings all through it with ladle, and set it away until it becomes hard, if soft, letting it stand two or three hours; now, work it well in brine, pour off, and it is ready for salt. Weigh or estimate the amount, and to every pound add one and one-fourth ounce of the best dairy salt, work in evenly all through it, then set on cellar-bottom until morning. Now, work about four pounds at a time, with back of ladle toward you. Go through, drain off, turn it over, go through again, and keep doing so as long as it looks honey-combed, or spongy, or under-rich, then pack in clean, sweet tub; if wood, let it soak in brine, put in hot, two or three days before using, press wet cloth smoothly over it until next churning. When full, put nice, fine cloth over it, wetting all cloths in brine; now sprinkle over a little salt, put on cover, and it is ready for marking and shipping. As they now have ice-cars, it is not necessary to keep it on hand long.

There is no use in having streaked or poor butter if these directions are implicitly followed. If by any accident you have a churning white and soft, don't pack it with good butter, keep it for family use. It will be just as sweet, but will spoil the market for the good. With proper care your butter will be all alike, rich in color, firm in texture, and I believe just as good as creamery-

butter. In fact, I have a creamery now, but can see no difference in quality as yet. They save an immense amount of labor, however, in case of milk, and I think the time is coming when every dairy woman must have her creamery.

When the weather gets too cold for milk in the cellar, the shelves are taken down and placed in a small room near the kitchen stove. Slat shelves, I should have said, are for the better circulation of air about the milk, having the effect of cooling it quicker. I prefer setting milk in pans in winter rather than to use the creamery, as I let it stand twenty-four hours, then warm on the stove, quite warm, but not hot, skimming next day. The butter will come much sooner, and be firmer and richer in color. I have never used "butter color;" I have seen it used but was not pleased with it, as it did not give a natural color, but imparted a reddish tint. A Jersey cow in your dairy herd, or a Jersey grade even, is the best "butter color," but in its absence, if it seems desirable to use something that will produce a natural shade, and not injure its delicate flavor, the orange carrot does nicely. Scrape two or three, then grate into a bowl of sweet milk, let stand a while to extract the color, then strain into the cream some time before churning. I never practiced washing butter until I began using brine for that purpose. From experiments, I was quite sure that washed butter did not keep as well, then I washed it over twice before packing, and I am not sure yet but it is the better way. To prove that it was good I will cite a few facts: A few years since I sold a firkin of 100 pounds to a sister in Toledo. It was made in June and sold in the fall. She said it kept nice and sweet until used up, the next August, over a year. One March I sold 40 pounds made the summer before about June, to one of our merchants. He took it all home. As his family was small, it lasted until about the first of August sweet and good. He said to me, "I never saw such butter." Six or seven years since I sent a 50 pound package to our daughter in Boston. The first three days the weather was cool, then it became exceedingly hot. For some reason it was thirteen days on the way. The agent said to her, "Of course the butter is spoiled; it is our fault; set a good big price and we will pay you." Her answer was, "It's mother's butter; I'll risk it;" and took it home. On opening it she found it so melted that she took out a bowl full of clear oil. Then transferring the rest to a stone jar, and placing in a refrigerator, it soon became hard. I spent some time with them in the fall and could detect nothing wrong in the butter. It was perfectly sweet. These instances suffice to show that an article can be made that will not hurt, under ordinary circumstances. Stone jars are the best to keep it in during the summer. Fill within three inches of the top, put on cloth, fill with salt and put water on sufficient to saturate it so as to keep air entirely out. It must be re-packed very carefully to ship, very carefully, but not re-worked. Let it be borne in mind never to re-work butter that has been packed and become solid. It destroys the grain and it will soon spoil. Place your jar where it will keep cold and of even temperature, but not freeze. Be careful about overworking when butter is soft; try and get it hard first. Every farmer that pretends to keep anything of a dairy should provide ice every winter, for it is just as impossible to make a uniformly fine article without it, unless you have a good fountain, as it was for the Israelites of old to make "bricks without straw." There is a growing tendency among farmers of late to do this, and in proportion as creameries become popular they will see the necessity of it. Our buyers should discriminate more, and pay better prices for a fine article and less for poor, then there would be more encouragement to do better. A fine article of butter, like a fine horse, should command a good price, even if it is not creamery butter. While others were selling this past summer for 8 or 10 cents, I got 20 and 22 in eastern markets. Every dairy woman should have a dairy thermometer—62° in summer and 63° in winter, is the rule for the cream.

ESSAY ON BUTTER-MAKING IN PRIVATE DAIRIES.

BY MRS. CLARA C. TITUS, BATAVIA, OHIO.

[Recommended for Publication by the Committee of Awards.]

Most articles written for the benefit of butter-makers in private dairies make the mistake, as it seems to me, of supposing them to have all the modern conveniences of ice, creameries, patent churns and butter workers, but observation has shown me that most of our butter, at least in Southern Ohio, is supplied by farmers' wives, who, like myself, have many difficulties to contend with, and it is for their encouragement that I write this.

I will presume, however, that everyone has a cellar or milk-house, which is preferable on some accounts, as while it is not so cool as the cellar, it is not the annual receptacle of potatoes, apples, cider, vinegar, soap and vegetables. A thermometer, costing but twenty cents, is almost indispensable in winter, especially if the saving of time is any object. The cellar or milk-house should be whitewashed thoroughly every spring, and on no account should any spilled milk be allowed to decay and dry up, but should be washed up immediately. As soon as the cellar work is done in summer, dash cold water freely over the floor, this will keep the cellar cool by evaporation. Keep the windows darkened during the heat of the day, but open at all other times, especially at night.

All vessels for holding milk should be first washed off in cold water to remove all the sour milk clinging to them, before the final washing with hot soapy water, then scalded and placed *right side up* on the bench that the sun may finish the work so well begun by yourself. The same care should be exercised over the churn, never allowing the buttermilk to stand in it any great length of time.

By all means use a pressed tin pan for taking up butter in and have two if you churn every day. I discarded the wooden bowl long ago, as reason and experience taught me that when the butter stood several hours in it the wood absorbed milk or brine, and in time becoming heavily charged with it, would yield a flavor to the butter that can not be imparted to it by a tin bowl. Another thing I abandoned years ago was the old-fashioned stone cream jar, not for the sake of the butter, but of the woman who has to carry it, using instead tall, straight two and three gallon buckets, which can be easily carried up and down cellar.

Here, almost upon the threshold of my subject, let me say that "eternal vigilance" is the price of good butter, and she who does not care to exercise it, though she may have every modern convenience applicable to dairy purposes, will fail in obtaining it.

MILKING.

Who shall do the milking has been the theme of many a discussion in western families, but with us it is decided in this way: If my husband has the most help, it is done by men. If not, women do it. But whoever does it I prefer to have the cows stabled, winter and summer, as it is a cleaner and more expeditious way. Any one who has tried milking in a muddy barnyard, where the cows can leave you whenever they choose, knows there is a loss both of milk and patience, two very necessary ingredients in butter making.

SETTING THE MILK.

In summer, strain the milk shallow, in either crocks or pans, and in extremely hot weather I prefer setting it on the floor, uncovered, except at night. It is always best for the animal heat to pass off before covering. If I owned a spring-house with running water, I would use deep vessels and strain them nearly full, placing them in a trough so arranged that the water would come well up to the top. I would have a natural creamery unequalled by any modern inventions.

In winter, have the kitchen floor swept before the morning milk comes up. Strain deep and set the vessels on the back of the stove, if you have no side shelf to your stove, so that it may heat slowly. When the cream begins to wrinkle it may be carried to the pantry or safe, but never keep it in a close place with food of any kind, as cream is a great absorbent and readily appropriates any odor floating around. Butter also that is good may be ruined by being confined with food having strong odors.

Skimming may be done just before or after the milk thickens, but great care should be used that it does not stand too long in the cream before churning, lest it impart a bitter taste to the butter. Keep a paddle made of hard wood in the cream bucket, and stir well and often. Change of temperature occurs so often, and has such an effect on the turning of the milk that it is impossible to say how many hours it should stand before skimming, but the careful dairy-woman will examine well every morning, and in extremely hot weather, twice a day, in order to determine what milk is ready to skim. I have found it a good way to have pieces of paste-board with morning and night of each day printed on them, and placed by each milking. By this means any person can find the age of the milk without inquiring, thus saving trouble and mistakes.

CHURNING.

In summer, scald the churn over night, draw off the water early in the morning, and put in the cold. Let the churning be done as early as possible, using freely of the coldest water after it begins to come so that the butter may be firm. Take up and press the milk out gently, and allow one half ounce of fine salt to each pound of butter. Cover the salt but avoid working much lest you break the globules and make it greasy. Set on the cellar floor, and in an hour or two the salt may be thoroughly in, and the milk pressed out. I frequently work again when straining the milk at night, but do not make into rolls until next morning. In winter, it is better to work a sufficient number of times the same day you churn and make into rolls as it becomes too solid if allowed to stand over night. From 62° to 64° Fahrenheit is considered the right warmth to begin churning, and much time is saved by testing instead of guessing at it.

Always weigh and shape your rolls the day before carrying them to market, so that they will become firm. Put on plates, set them on cellar floor, and turn crocks over them. (I keep all the cracked ones for that purpose.) In packing it to carry to your customers, two hours before you start place the rolls still on the plates in tin buckets of the coldest water at your command in the cellar. This will make them solid. Have your basket in the cellar to get cool, and wring a blanket, kept for that purpose, out of the water, and line the basket with it. Wrap each roll in a wet white cloth, lay them in and cover well with the blanket, and you will be able to carry them in good shape if not solid.

There are many things that will suggest themselves to the dairy-woman,

many things she will read and ponder over in the agricultural papers that she will do well to prove, and hold fast those which are good.

Not having any ice-house, we pursue this plan. An hour and a half before meal-time we take a tin bucket of the coldest water to the cellar, and put a plate with a slice or pat of butter on it in the water.

Let the butter be the last thing placed on the table, and your family will testify your butter is not only "gilt-edged," but solid gold clear through.

STATISTICS

OF THE DIFFERENT

Crops and Productions,

FOR THE YEAR 1885,

ALSO, OF MAPLE SUGAR, FOR 1886; SHEEP KILLED AND
INJURED BY DOGS FOR THE YEAR PRECEDING THE
SECOND MONDAY OF APRIL, 1886, AND THE NUM.
BER OF DOGS; ALSO, THE NUMBER OF HORSES,
CATTLE, SHEEP, HOGS, AND MULES, FOR
THE YEARS 1885 AND 1886, WITH
BALANCES FOR 1884 AND 1885.

WHEAT AND RYE.

Counties.	Wheat.					Rye.		
	Acres sown.	Bushels produced.	Average per acre.	Acres sown for 1886.	Cost of commercial fertilizers for crop of 1886.	Acres sown.	Acres sown for 1886.	Bushels produced.
Adams	18,735	88,533	4.73	19,519	\$109,005	202	600	1,203
Allen	29,796	460,669	15.46	33,829	48	432	388	8,067
Ashland	36,500	443,339	12.14	37,485	6,474	255	312	2,196
Ashtabula	16,414	234,070	14.26	17,537	33,395	148	119	2,052
Athens	10,319	24,695	2.39	12,573	5,886	101	231	501
Auglaize	37,155	594,538	16.00	40,952	.....	333	254	5,635
Belmont	24,333	83,141	3.42	23,994	5,327	219	329	2,119
Brown	21,628	72,616	3.35	23,068	3,693	1,995	3,396	11,648
Butler	48,345	233,791	4.84	54,557	137	184	226	2,453
Carroll	18,162	81,869	4.51	17,942	828	691	838	5,667
Champaign	46,495	161,614	12.08	50,938	2,759	129	90	1,375
Clarke	33,389	363,668	10.88	43,872	573	278	216	4,267
Clermont	16,853	65,837	3.91	16,953	2,774	1,026	1,666	7,555
Clinton	32,511	160,389	4.93	35,630	334	137	119	1,692
Columbiana	23,846	159,241	6.68	21,560	11,198	832	985	8,803
Coshocton	33,640	72,992	2.17	32,378	3,149	292	635	1,778
Crawford	31,482	512,287	16.27	35,384	165	170	70	2,399
Cuyahoga	10,527	184,680	17.45	11,567	26,359	772	758	16,144
Darke	61,586	996,331	16.17	70,359	175	491	334	8,440
Defiance	25,023	342,354	13.68	30,543	129	750	825	12,721
Delaware	29,238	279,917	9.57	28,377	234	258	236	1,671
Erie	20,416	247,824	12.14	19,880	1,868	108	340	2,477
Fairfield	46,379	160,756	3.46	53,481	2,215	305	408	3,043
Fayette	26,652	111,318	4.18	33,925	10	377	342	2,865
Franklin	45,982	145,240	3.16	49,468	4,762	314	461	2,689
Fulton	23,909	375,532	15.71	27,954	179	884	1,323	12,132
Gallia	22,961	44,552	1.94	20,820	1,702	137	211	801
Geauga	7,924	148,178	18.70	8,713	16,746	102	36	1,509
Greene	48,812	362,749	7.43	53,981	214	268	242	2,707
Guernsey	16,355	68,313	4.17	17,119	4,350	425	808	3,114
Hamilton	11,234	60,489	5.38	11,448	582	1,416	2,017	19,258
Hancock	50,636	850,947	16.82	61,669	416	776	933	11,889
Hardin	34,395	522,072	15.18	44,676	170	728	725	7,540
Harrison	14,674	46,135	3.14	14,365	2,148	243	443	2,429
Henry	23,974	371,556	15.49	28,775	10	4,228	4,165	83,113
Highland	34,531	157,110	4.55	37,956	11,880	567	941	3,127
Hocking	9,514	50,465	5.29	10,496	3,380	437	588	1,957
Holmes	35,204	114,816	3.26	30,152	1,048	424	772	4,661
Huron	29,266	450,150	15.28	35,655	7,426	243	235	2,868
Jackson	8,918	33,790	3.88	10,060	8,302	50	74	182
Jefferson	17,149	50,357	2.93	16,015	2,993	551	568	2,431
Knox	38,496	132,476	3.44	34,667	3,184	529	804	4,639
Lake	5,676	67,973	11.96	5,182	157,855	540	486	10,120
Lawrence	14,372	24,169	1.68	15,737	716	117	154	503
Licking	40,339	104,212	2.58	37,859	1,762	679	1,329	5,955
Logan	40,145	622,932	15.51	46,755	839	75	118	1,399
Lorain	23,701	331,824	14.00	23,716	6,912	137	136	2,077
Lucas	11,752	175,301	14.92	12,517	65	1,383	1,665	21,308
Madison	16,966	106,397	6.27	17,150	.....	146	93	2,425
Mahoning	13,952	124,607	8.93	14,010	16,999	175	238	2,877
Marion	30,341	431,884	14.23	38,655	.....	64	60	876
Medina	20,119	459,346	22.83	21,465	30,904	95	68	1,670
Meigs	15,992	39,632	2.48	16,644	9,030	171	323	977
Mercer	31,753	497,692	15.67	37,719	.....	222	181	3,130
Miami	50,555	778,521	15.39	56,270	291	96	181	1,391
Monroe	18,746	78,886	4.21	18,268	5,161	349	563	3,563
Montgomery	46,724	440,198	9.44	65,433	1,546	238	396	3,181
Morgan	15,361	66,682	4.34	17,398	7,750	75	234	905
Morrow	19,378	220,010	11.35	23,491	10,557	202	116	1,638
Muskingum	31,421	92,927	2.95	34,066	10,629	679	1,600	6,426
Noble	14,511	75,030	5.17	15,171	4,448	90	297	866

WHEAT AND RYE—Continued.

Counties.	Wheat.					Rye.		
	Acres sown.	Bushels produced.	Average per acre.	Acres sown for 1886.	Cost of commercial fertilizers for crop of 1886.	Acres sown.	Acres sown for 1886.	Bushels produced.
Ottawa	16,093	183,369	11.39	15,008	.....	2,258	2,552	40,460
Paulding	11,192	147,889	13.21	14,261	\$0 42	218	353	2,912
Perry	14,060	73,980	5.25	17,131	12,398	322	566	3,091
Pickaway	36,282	68,843	1.89	53,055	465	423	361	2,408
Pike	11,236	59,427	5.29	13,115	6,889	154	293	1,673
Portage	24,158	422,253	17.48	20,154	30,972	173	128	2,597
Preble	37,618	300,482	7.98	36,617	4,228	86	163	887
Putnam	31,425	542,836	17.27	38,137	58	1,513	1,740	29,893
Richland	43,559	565,904	12.99	44,869	6,722	396	587	4,331
Ross	35,245	99,321	2.81	43,793	3,204	377	679	2,497
Sandusky	41,530	498,332	11.99	42,797	10	781	853	12,799
Scioto	10,458	49,149	4.69	11,550	4,196	68	44	173
Seneca	60,392	942,848	15.61	64,570	30,975	255	247	3,968
Shelby	43,429	690,608	15.89	49,793	391	120	111	2,478
Stark	58,669	566,062	9.69	60,427	18,776	365	397	4,379
Summit	28,203	483,318	17.14	38,327	11,216	163	146	2,930
Trumbull	13,478	195,703	14.52	14,608	23,864	188	252	2,037
Tuscarawas	38,808	115,573	2.99	35,230	2,136	400	730	3,258
Union	31,475	372,057	11.82	33,757	326	77	50	1,211
Van Wert	24,062	331,003	13.76	27,712	780	1,020	1,092	16,056
Vinton	7,838	27,420	3.49	7,284	2,388	181	259	630
Warren	33,327	151,633	4.55	32,318	1,600	267	630	2,213
Washington	28,826	85,084	2.95	30,251	20,023	604	1,152	4,249
Wayne	59,115	518,786	8.77	54,270	15,419	179	226	2,570
Williams	27,529	415,793	15.10	31,039	54	68	33	1,112
Wood	32,591	307,952	15.58	40,285	1,615	3,213	3,715	68,935
Wyandot	32,129	508,846	15.84	37,422	391	235	299	4,232
Totals	2,467,899	24,183,430	9.84	2,714,990	\$757,469	42,144	55,439	579,082

BUCKWHEAT AND OATS.

Counties.	Buckwheat.		Oats.			
	Acres sown.	Bushels produced.	Acres sown.	Acres sown for 1886.	Bushels produced.	Average per acre.
Adams.....	42	545	5,926	7,340	105,645	17.83
Allen.....	61	1,053	8,151	7,670	245,230	30.09
Ashland.....	257	3,202	15,246	15,177	537,853	35.22
Ashtabula.....	719	16,241	10,768	19,311	677,555	62.92
Athens.....	257	2,936	2,608	2,808	44,123	16.81
Auglaize.....	227	2,936	9,113	8,070	296,812	32.57
Belmont.....	699	7,554	12,249	11,417	368,778	30.11
Brown.....	36	263	11,312	13,237	327,346	28.94
Butler.....	125	1,225	14,802	11,804	542,322	36.64
Carroll.....	927	11,376	13,071	11,786	41,738	3.19
Champaign.....	85	1,995	4,489	2,859	137,736	30.68
Clarke.....	76	1,420	3,777	3,335	122,587	32.46
Clermont.....	92	880	16,153	15,868	406,447	25.16
Clinton.....	123	1,471	6,286	5,005	220,197	35.03
Columbiana.....	666	9,900	17,951	17,976	580,660	32.34
Coshocton.....	970	10,505	9,066	9,066	290,057	31.92
Crawford.....	25	457	16,967	16,010	41,784	26.45
Cuyahoga.....	136	627	14,523	14,419	550,108	38.15
Darke.....	126	1,682	14,136	11,648	472,201	33.40
Defiance.....	228	3,076	10,341	11,425	242,330	28.43
Delaware.....	121	1,482	5,094	4,815	156,478	30.72
Erie.....	496	10,943	8,612	9,623	294,676	34.22
Fairfield.....	262	3,288	5,277	3,733	147,455	27.94
Fayette.....	65	958	4,993	2,084	164,634	32.97
Franklin.....	215	2,412	7,440	4,507	221,319	29.74
Fulton.....	461	4,524	12,793	11,723	362,327	28.32
Gallia.....	294	1,633	4,702	5,589	84,035	17.87
Geauga.....	130	1,884	10,468	9,742	383,891	36.67
Greene.....	38	578	4,668	3,505	183,639	34.34
Guernsey.....	1,261	8,073	7,615	7,627	206,490	27.11
Hamilton.....	109	1,230	11,098	8,190	343,467	30.94
Hancock.....	103	1,302	8,754	7,377	246,117	28.11
Hardin.....	98	1,321	6,892	4,593	145,646	21.13
Harrison.....	527	7,559	7,448	6,921	272,389	36.57
Henry.....	189	2,638	6,840	5,730	153,881	22.49
Highland.....	41	439	7,469	8,402	176,596	23.64
Hocking.....	391	3,926	2,053	1,836	88,328	18.67
Holmes.....	1,102	14,529	15,206	15,250	556,989	36.63
Huron.....	251	1,929	2,442	21,479	711,713	34.81
Jackson.....	109	1,217	3,283	4,759	45,134	9.60
Jefferson.....	408	4,931	11,470	11,097	410,191	35.76
Knox.....	969	11,894	9,733	10,556	352,271	36.19
Lake.....	152	2,986	6,166	5,731	224,405	39.17
Lawrence.....	90	453	4,734	5,793	177,727	37.54
Licking.....	1,058	13,692	8,869	9,305	290,688	32.77
Logan.....	99	1,276	4,700	3,836	111,359	23.60
Lorain.....	26	141	16,891	17,570	678,717	40.18
Lucas.....	723	7,999	7,345	6,874	222,585	32.37
Madison.....	32	480	2,588	2,148	103,512	39.90
Mahoning.....	219	2,780	13,111	11,845	459,500	31.04
Marion.....	37	489	7,920	7,508	188,656	23.82
Medina.....	12	119	71,502	12,866	556,573	43.26
Meigs.....	37	4,188	3,884	4,879	76,455	19.68
Mercer.....	122	1,514	12,991	12,340	397,566	32.22
Miami.....	56	919	7,504	7,771	241,541	32.17
Monroe.....	562	6,216	8,955	10,118	221,978	24.78
Montgomery.....	36	554	14,241	17,600	441,125	30.97
Morgan.....	287	3,317	3,431	3,083	65,841	19.19
Morrow.....	104	1,256	10,672	11,232	379,851	35.68
Muskingum.....	659	7,042	6,709	7,755	187,177	27.80
Noble.....	246	2,734	4,737	5,197	131,058	27.66
Ottawa.....	189	3,423	3,678	4,261	123,857	33.67
Paulding.....	121	1,328	3,350	3,317	66,404	19.82
Perry.....	262	3,276	2,118	2,020	51,448	24.29

BUCKWHEAT AND OATS—Continued.

Counties.	Buckwheat.		Oats.			
	Acres sown.	Bushels produced.	Acres sown.	Acres sown for 1886.	Bushels produced.	Average per acre.
Pickaway	203	2,750	5,145	9,116	166,605	32.39
Pike	52	591	6,116	6,877	96,701	15.81
Portage	153	1,646	14,844	14,712	541,845	36.50
Preble	79	1,351	12,860	13,201	446,857	34.75
Putnam	86	1,446	3,671	2,860	89,886	24.49
Richland	342	3,077	20,991	21,529	699,092	33.30
Ross	62	669	5,262	4,629	140,706	26.74
Sandusky	287	4,445	11,064	10,649	334,184	30.20
Scioto	21	144	6,899	7,459	99,252	14.38
Seneca	77	1,538	16,424	16,607	537,934	32.87
Shelby	140	1,899	10,744	10,080	307,518	28.62
Stark	289	3,903	25,910	26,995	1,021,690	39.43
Summit	69	1,245	14,135	13,688	601,562	42.5
Trumbull	416	5,697	16,479	17,829	506,502	30.73
Tuscarawas	897	10,970	17,615	18,033	547,528	31.08
Union	39	678	3,112	2,262	89,244	28.68
Van Wert	287	2,880	6,578	5,006	143,073	21.75
Vinton	130	1,299	2,063	2,929	38,959	18.88
Warren	130	1,602	11,019	11,837	408,338	37.06
Washington	855	10,316	9,350	11,060	239,796	25.64
Wayne	273	6,878	21,655	22,126	822,664	37.99
Williams	63	1,305	15,423	15,874	434,102	28.14
Wood	405	6,270	15,855	13,401	397,925	25.09
Wyandot	40	813	6,853	5,676	173,006	25.25
Totals	24,383	308,431	908,458	843,083	26,599,264	29.28

BARLEY AND CORN.

Counties.	Barley.			Corn.			
	Acres sown.	Acres sown for 1886.	Bushels produced.	Acres planted.	Acres planted for 1886.	Bushels (shelled) produced.	Average per acre, 1885.
Adams	5		20	33,195	29,549	942,231	28.38
Allen	36	34	665	30,908	33,932	1,157,149	37.43
Ashland	155	161	2,319	23,638	22,391	861,675	36.45
Ashtabula	284	338	6,641	13,676	11,453	382,238	27.96
Athens		20		18,078	15,274	638,984	35.34
Auglaize	740	810	18,795	36,582	36,484	1,330,471	36.37
Belmont	97	164	2,732	27,151	23,381	1,095,664	40.35
Brown				41,253	39,739	1,261,807	30.58
Butler	8,466	12,116	59,524	74,237	60,748	3,335,595	44.93
Carroll	25	15	401	14,115	10,660	514,155	36.42
Champaign	62	169	1,085	46,638	46,615	1,978,697	42.43
Clarke	113	137	1,250	39,998	38,600	1,870,152	46.75
Clermont	56	64	489	36,285	31,918	1,219,477	33.61
Clinton	5		24	58,480	50,793	2,419,796	41.38
Columbiana	22		549	19,168	17,301	645,329	33.66
Coshocton	1	4	14	27,091	24,723	992,890	36.65
Crawford	152	198	3,083	29,216	29,247	927,107	31.75
Cuyahoga	123	78	2,709	11,235	9,259	360,664	32.10
Darke	444	444	8,180	69,906	66,225	3,066,476	43.86
Defiance	342	514	5,895	21,126	21,492	650,887	30.81
Delaware	22	37	280	36,806	31,680	1,410,875	38.33
Erie	1,286	1,800	36,219	16,284	15,269	564,863	34.69
Fairfield	132	263	745	60,235	51,961	2,649,925	43.99
Fayette	2	33	44	63,292	60,190	2,594,944	40.99
Franklin	1	16	20	83,325	61,835	3,590,968	43.09
Fulton	63	97	1,005	22,634	20,727	680,014	30.04
Gallia	1		6	23,606	19,160	654,383	27.72
Geauga	31	63	708	7,487	6,291	253,691	33.88
Greene	177	185	1,445	56,228	57,905	2,560,852	45.54
Guernsey	19	28	438	18,354	19,814	671,694	36.59
Hamilton	1,405	1,868	11,975	27,507	20,592	1,086,866	39.51
Hancock	33	52	539	47,644	46,535	1,609,781	33.79
Hardin	7	10	125	35,605	30,791	1,261,187	35.42
Harrison	32	33	690	13,983	12,600	579,869	41.47
Henry	127	212	2,132	21,321	26,492	901,173	37.05
Highland	33	32	492	54,228	50,981	1,877,605	34.62
Hocking	8	10	92	14,614	12,200	441,273	30.19
Holmes	45	47	813	22,838	21,931	827,265	36.22
Huron	171	224	4,258	7,357	23,236	790,455	29.99
Jackson		1		14,585	14,908	391,049	26.81
Jefferson	52	169	1,492	15,003	13,156	634,975	42.32
Knox	6	15	65	33,240	30,566	1,188,574	35.76
Lake	586	245	13,432	6,433	5,551	201,550	36.30
Lawrence	4	2	115	19,251	15,422	493,786	25.65
Licking	65	144	1,256	50,226	44,333	190,422	39.51
Logan	146	78	2,897	37,856	35,627	1,255,969	33.17
Lorain	543	469	10,198	18,611	17,005	613,894	32.98
Lucas	323	398	8,400	14,633	12,499	440,319	30.09
Madison	2		70	64,965	60,122	2,916,669	44.89
Mahoning	2	12	45	12,973	10,340	372,734	28.74
Marion	36	71	827	41,831	38,430	1,486,450	35.53
Medina	10	6	264	15,211	11,954	468,055	30.77
Melgs	65	10	1,051	17,551	14,622	557,978	31.79
Mercer	221	295	5,564	36,098	35,567	1,363,780	37.77
Miami	874	814	13,570	52,948	53,292	2,442,155	46.12
Monroe	16	10	213	19,272	17,063	633,814	32.88
Montgomery	1,509	1,919	17,954	53,673	47,544	3,151,954	55.65
Morgan	4	22	160	17,559	15,321	645,442	36.76
Morrow	8	13	183	23,453	21,777	750,196	31.00
Muskingum	148	216	2,194	32,272	29,777	1,218,718	37.76

BARLEY AND CORN.—Continued.

Counties.	Barley.			Corn.			
	Acres sown.	Acres sown for 1886.	Bushels produced.	Acres planted.	Acres planted for 1886.	Bushels (shelled) produced.	Average per acre, 1886.
Noble.....	3	.....	70	20,544	16,857	765,762	37.27
Ottawa.....	402	673	9,823	14,299	14,131	482,517	33.74
Paulding.....	37	21	301	12,658	12,585	371,087	29.31
Perry.....	12	6	308	17,842	16,525	641,649	35.96
Pickaway.....	216	247	3,940	94,760	74,533	4,298,265	45.36
Pike.....	42	40	101	26,099	23,588	973,561	37.50
Portage.....	38	17	757	13,527	11,768	452,000	33.41
Preble.....	352	454	3,870	46,599	43,029	1,912,960	41.05
Putnam.....	53	80	1,565	41,136	41,174	1,492,905	36.29
Richland.....	371	301	5,895	27,982	28,880	910,458	32.54
Ross.....	369	256	3,582	73,564	62,339	3,059,162	41.58
Sandusky.....	325	469	6,423	36,034	31,128	1,176,632	32.65
Scioto.....	21	32	193	23,131	15,325	707,840	30.60
Seneca.....	173	282	3,272	39,777	39,415	1,519,646	38.20
Shelby.....	674	586	14,421	39,938	39,984	1,534,503	38.42
Stark.....	279	320	6,692	28,779	27,353	1,164,507	40.46
Summit.....	41	26	925	15,808	13,679	593,040	37.51
Trumbull.....	40	80	994	13,639	13,201	412,794	30.26
Tuscarawas.....	54	133	1,170	23,517	21,265	840,149	35.72
Union.....	40	27	1,660	41,263	34,563	1,559,801	37.80
Van Wert.....	31	15	455	32,531	31,085	1,118,161	34.58
Vinton.....	.....	5	.....	12,037	11,305	342,730	28.47
Warren.....	2,512	2,591	12,993	50,296	45,959	2,169,407	43.13
Washington.....	.....	7	.....	27,709	22,799	859,851	31.03
Wayne.....	91	90	2,947	30,975	30,514	1,242,429	40.11
Williams.....	99	105	1,920	24,997	24,565	797,458	31.90
Wood.....	485	658	10,428	51,447	49,811	1,805,153	35.08
Wyandot.....	22	6	560	31,508	29,835	1,135,582	36.04
Totals.....	26,238	31,418	351,616	2,937,164	2,592,053	108,211,694	36.84

BROOM-CORN, MEADOW, AND CLOVER.

Counties.	Broom-corn.		Meadow.		Clover.			
	Acres sown.	Pounds of broom brush produced.	Acres.	Tons of hay.	Acres.	Tons of hay.	Bushels of seed.	Acres plowed under for manure.
Adams	27	1,225	13,067	8,373	3,427	1,205	477	300
Allen	14	2,650	17,505	22,275	6,070	5,389	558	468
Ashland	2	2,500	24,695	33,166	8,574	11,445	2,363	488
Ashtabula			50,489	69,075	2,837	4,068	2,267	179
Athens			21,585	16,300	303	245		20
Auglaize	1	830	13,573	18,362	7,054	9,209	882	2,218
Belmont	7	3,085	34,976	31,523	602	550	11	25
Brown	3	1,689	17,635	12,247	6,358	1,292	15	937
Butler	318	176,190	13,671	16,414	15,037	5,342	1,118	5,021
Carroll	$\frac{1}{2}$	65	32,706	35,737	512	408	51	6
Champaign	50	65,650	13,104	16,025	12,119	8,482	5,921	2,073
Clarke	1	300	14,828	18,853	9,080	7,213	4,660	2,440
Clermont	30	10,140	23,308	19,349	6,939	1,922	76	1,817
Clinton	4	1,750	15,054	17,285	3,483	2,270	577	350
Columbiana	5	11,000	46,231	57,240	2,351	3,121	820	40
Coshocton	1	300	33,241	35,431	1,415	1,322	252	54
Crawford			22,044	31,550	7,828	10,889	953	622
Cuyahoga	10	20	32,461	46,960	1,548	2,045	201	95
Darke	71	36,545	12,582	15,740	24,383	13,835	4,287	7,552
Defiance			14,914	18,419	7,479	7,827	1,405	1,624
Delaware	$\frac{3}{4}$	265	38,353	45,472	3,849	2,784	451	586
Erie	46	3,000	12,045	15,715	4,802	4,854	548	1,218
Fairfield	116	100	18,731	20,880	4,878	3,318	1,201	131
Fayette	52	9,100	18,634	12,972	3,894	1,325	360	655
Franklin	150	76,130	29,255	32,228	2,755	1,888	333	1,867
Fulton	7	3,450	15,519	19,232	9,996	11,241	1,136	588
Gallia	10	2,922	14,301	8,130	867	424	48	216
Geauga	2	600	28,782	41,393	1,211	1,953	410	231
Greene	67	1,923	12,568	16,619	8,536	4,802	2,373	3,268
Guernsey	1	240	30,523	29,152	206	193	3	
Hamilton	44	16,952	17,910	21,712	2,987	3,050	207	746
Hancock	25	6,283	22,180	30,926	10,608	12,899	1,875	1,075
Hardin	$\frac{1}{4}$	25	21,031	25,258	4,279	5,278	849	535
Harrison	2	600	31,400	31,896	65	65		
Henry	$\frac{3}{8}$	87	10,013	13,346	5,122	5,659	944	832
Highland	2	947	24,616	21,785	1,895	1,253	389	314
Hocking			14,612	11,650	654	518	73	69
Holmes	8	2,450	25,303	29,731	6,083	6,424	2,220	184
Huron	$10\frac{1}{4}$	2,423	34,706	44,430	8,724	10,303	822	715
Jackson		78	16,963	8,754	92	33		10
Jefferson	10	5,010	28,111	29,374	844	822	192	10
Knox	39	510	34,619	41,248	4,602	4,751	1,885	274
Lake	$\frac{1}{2}$	700	15,229	19,542	1,607	2,235	930	71
Lawrence	18	1,200	7,095	4,769	2,157	419	86	343
Licking	5	2,010	49,246	53,873	2,901	2,767	691	173
Logan			19,175	23,912	7,171	7,948	3,111	474
Lorain	$\frac{1}{4}$	80	41,630	45,326	3,885	5,658	414	240
Lucas			13,327	15,264	2,737	3,011	982	479
Madison	49	30,742	22,350	23,902	2,269	2,320	153	208
Mahoning			31,838	43,576	6,111	7,707	2,979	266
Marion	$\frac{1}{8}$		20,302	24,816	60,076	5,436	719	267
Medina	48	80	28,488	34,903	7,482	10,080	2,224	448
Meigs	12	2,410	17,531	11,371	848	192	28	312
Mercer	$\frac{1}{8}$	75	15,133	20,549	7,264	8,088	1,917	1,036
Miami	62	39,970	6,930	9,214	18,916	12,686	5,292	6,361
Montroe	2	1,265	24,311	20,352	552	222	29	10
Montgomery	105	64,578	12,682	15,181	17,476	9,467	4,313	6,016
Morgan	3	1,272	25,233	23,693	705	789	23	26
Morrow	32	75	34,215	38,804	1,894	2,448	187	59
Muskingum	1	760	43,624	40,252	1,023	1,007	55	9
Noble			24,026	20,345	155	76	2	

BROOM-CORN, MEADOW, AND CLOVER—Continued.

Counties.	Broom-corn.		Meadow.		Clover.			
	Acres sown.	Pounds of broom brush produced.	Acres.	Tons of hay.	Acres.	Tons of hay.	Bushels of seed.	Acres plowed under for manure.
Ottawa			7,115	10,743	6,941	10,627	2,810	439
Paulding			10,636	12,674	2,844	2,306	355	550
Perry	1	650	23,835	21,763	265	224	146	
Pickaway	848	607,516	16,328	11,256	2,873	1,393	734	282
Pike	3		8,463	5,653	1,405	943	419	764
Portage	24 $\frac{3}{4}$	2,430	31,058	43,369	5,865	7,905	2,279	427
Preble	38	11,335	10,090	10,278	21,393	5,296	2,520	4,907
Putnam	4 $\frac{1}{2}$	1,465	16,656	23,723	4,752	5,682	395	1,039
Richland			30,132	41,146	8,330	9,781	1,363	1,027
Ross	45	9,600	13,058	10,631	8,627	2,267	1,339	2,439
Sandusky			12,317	15,937	12,308	16,477	1,537	1,257
Scioto	8 $\frac{1}{4}$	200	10,596	6,846	598	238	7	235
Seneca		90	20,821	25,811	20,273	23,264	3,574	2,571
Shelby	3 $\frac{1}{2}$	2,400	10,036	12,262	10,876	9,720	2,111	2,086
Stark	1 $\frac{1}{2}$	150	39,652	57,281	7,699	9,941	1,259	528
Summit	1	65	22,027	33,840	9,110	9,782	1,473	876
Trumbull	3	2,000	52,630	62,471	3,209	4,437	812	133
Tuscarawas	3	1,300	40,015	48,482	1,841	1,923	303	60
Union	22	11,145	25,695	30,788	2,816	2,897	240	216
Van Wert	2 $\frac{3}{8}$	238	17,150	25,202	4,522	5,310	416	654
Vinton			12,886	8,386	150	103		
Warren	119	9,380	16,543	16,774	9,870	3,127	154	4,208
Washington	3	780	31,181	25,726	1,275	940	20	188
Wayne	1	1,100	32,972	50,488	9,791	13,515	3,121	644
Williams	1	51	18,665	22,913	10,334	10,540	2,205	296
Wood	1	500	19,315	27,354	8,689	11,934	1,960	1,018
Wyandot			18,121	23,837	7,696	7,274	949	749
Totals	2,604 $\frac{5}{8}$	1,254,046	1,988,202	2,266,925	543,929	442,027	100,967	84,224

FLAX AND POTATOES.

Counties.	Flax.			Potatoes.		
	Acres.	Bushels of seed.	Pounds of fiber.	Acres planted.	Acres for 1886 (estimated).	Bushels produced.
Adams				516	3,434	30,421
Allen	290	955	4	1,470	1,256	88,750
Ashland	914	8,244	564,200	1,095	991	85,835
Ashtabula	3	13	150	2,382	2,123	201,677
Athens				1,068	788	61,957
Auglaize	274	2,089		1,456	1,534	95,276
Belmont				1,350	1,230	117,273
Brown				1,111	1,096	66,258
Butler	332	3,012		1,481	1,311	125,229
Carroll				678	558	59,000
Champaign	410	3,710		1,026	996	88,365
Clarke	577	5,832	117,580	1,383	1,232	135,010
Clermont				2,750	2,571	138,748
Clinton	157	1,644		817	655	60,438
Columbiana	1	8		1,462	1,329	146,454
Coshocton				989	943	81,784
Crawford	675	5,051	16,980	1,360	1,318	192,231
Cuyahoga				5,785	4,652	456,817
Darke	888	8,765	91,457	2,373	2,197	215,809
Defiance	6	40		1,084	1,124	102,434
Delaware	13	73	105	1,004	818	81,534
Erie	10	100		2,923	2,891	301,306
Fairfield				1,781	1,724	148,092
Fayette	11	100		537	566	56,288
Franklin				2,632	2,300	209,789
Fulton	10	72		1,078	840	110,900
Gallia				976	637	62,480
Geauga	6	97		1,597	1,371	171,760
Greene	339	3,085	72,500	889	890	93,550
Guernsey				531	739	39,600
Hamilton				4,760	4,249	369,717
Hancock	679	3,918		1,520	1,623	114,344
Hardin	68	643	1	1,647	1,550	130,644
Harrison				491	394	40,533
Henry	$\frac{1}{2}$	3	212	1,079	1,065	104,490
Highland				1,008	866	66,480
Hocking	$\frac{1}{2}$	$3\frac{1}{2}$		982	847	68,473
Holmes				1,030	957	97,027
Huron	58	487	10,000	1,148	1,422	98,336
Jackson		1	10	650	416	29,120
Jefferson	6	68		1,053	945	101,292
Knox	908	7,557	6,080	1,066	946	94,029
Lake				1,022	756	97,115
Lawrence				594	303	33,665
Licking	205	1,846		1,607	1,508	148,191
Logan	49	440		753	677	68,762
Lorain	38	324	112,500	1,806	1,603	139,891
Lucas	159	1,122	6,000	2,358	2,082	234,241
Madison	17	160		550	627	50,153
Mahoning	93	831	50,100	1,255	1,026	124,081
Marion	184	1,848		999	993	87,387
Medina	1,054	10,447	104,730	874	877	77,453
Meigs				1,874	1,318	100,047
Mercer	104	645		867	879	68,139
Miami	2,827	28,064	1,023,630	1,356	1,034	116,840
Monroe				1,109	1,018	84,983
Montgomery	787	7,170	245,250	2,063	2,562	183,208
Morgan				866	778	53,269
Morrow	202	1,320	3,520	968	714	76,210
Muskingum	1	21		1,745	1,539	118,857

FLAX AND POTATOES—Continued.

Counties.	Flax.			Potatoes.		
	Acres.	Bushels of seed.	Pounds of fiber.	Acres planted.	Acres for 1886 (estimated).	Bushels produced.
Noble				686	732	48,176
Ottawa				1,126	899	62,106
Paulding				573	569	42,892
Perry				1,023	871	80,832
Pickaway	4	68		1,002	771	88,584
Pike	$3\frac{1}{4}$	2	75	795	725	51,423
Portage	165	1,703	84,300	3,631	2,905	273,890
Preble	778	6,840	86,917	881	675	80,008
Putnam	19	90		1,587	1,501	123,018
Richland	460	1,854	10	1,741	1,626	128,034
Ross				1,176	1,099	79,706
Sandusky				1,868	1,930	195,029
Scioto				2,265	883	73,188
Seneca	344	2,843	12,442	1,551	1,634	136,487
Shelby	1,455	11,399	135,100	994	960	83,222
Stark	2	11		2,459	2,394	235,758
Summit				1,727	1,519	157,644
Trumbull	694	5,753	390,200	1,899	1,655	152,800
Tuscarawas	4	9		1,549	1,439	139,465
Union				834	596	78,296
Van Wert	40	145	3,000	935	993	72,483
Vinton				550	377	58,671
Warren	88	859		1,226	1,105	88,603
Washington				2,219	1,999	145,885
Wayne	220	1,974	165,700	1,774	1,640	146,443
Williams	9	87		1,060	1,022	110,008
Wood	18	202	7,000	1,952	1,897	200,559
Wyandot	24	134		1,002	1,082	82,111
Totals	16,680 $\frac{1}{4}$	143,781	3,309,743	124,774	112,186	10,214,343

TOBACCO, MILK, BUTTER, AND CHEESE.

Counties.	Tobacco.		Milk.	Butter.		Cheese.	
	Acres planted.	Pounds produced.	Gallons sold for family use.	Pounds made in home dairies.	Pounds made in factories and creameries.	Pounds made in home dairies.	Pounds made in factories.
Adams	1,946	1,600,976	845	433,982		75	
Allen	79	95	58,500	435,433	100	12,510	
Ashland	1	100	109,657	593,230	58,940	5,000	471,850
Ashtabula	2	4,000	167,350	1,042,613	33,641	354,400	2,045,177
Athens	64	56,108	43,350	425,399		7,485	
Auglaize	8	7,600	73,166	448,242		1,705	
Belmont	1,361	1,425,866	188,119	743,059			
Brown	4,559	3,702,542	20,502	498,153		135	
Butler	545	502,849	72,739	623,509	3,500	4,645	
Carroll			18,985	566,966			47,000
Champaign	7	4,475	7,624	456,326	78	13,610	
Clarke	87	106,400	204,269	487,624		380	
Clermont	4,112	3,152,556	225,960	618,150		345	
Clinton	116	79,400	18,700	433,347	185	400	
Columbiana			308,711	674,279	20,882	19,190	585,308
Coshocton			6,625	582,745		4,000	
Crawford			23,997	671,549		2,500	
Cuyahoga			3,598,729	805,386	41,797	4,600	348,718
Darke	2,693	3,152,425	26,296	867,560		40	
Defiance	21½	14,985	18,915	508,729			20,800
Delaware	½	175	35,893	640,510	100	300	
Erie			117,795	394,117		3,240	2,000
Fairfield	1½	400	15,496	713,868		340	
Fayette	½	100	19,714	291,400		300	
Franklin		20	372,960	696,452	40	100	
Fulton			13,402	519,173	12,600	550	451,690
Gallia	218	153,325	38,288	461,471		470	
Geauga		125	110,609	466,807	225,400		1,550,832
Greene	326	312,487	89,080	510,104		2,960	
Guernsey	284	231,191	17,680	530,647		100	
Hamilton	196	212,100	3,066,717	683,634	16,525	3,028	
Hancock	1	700	29,593	680,940	4,325	400	1,500
Hardin	¾	565	55,376	530,314	1,400	550	
Harrison	1	250	42,055	604,988	7,000		9,100
Henry	2¼	400	5,295	447,078		560	
Highland	280	217,621	19,059	637,889		385	
Hocking	2½	1,800	6,474	387,598	102,820		140,500
Holmes	2	1,033	256,492	466,567	102,820	27,500	339,101
Huron		40	89,832	640,915	151,380	41,480	
Jackson			1,773	261,391		1,250	
Jefferson			69,020	482,213			
Knox	2	1,500	25,286	679,608	1,000		
Lake	8	8,800	165,845	278,379	141,130		35,660
Lawrence	76	52,620	47,920	169,006		300	
Licking	2	9,845	50,220	873,144		4,391	
Logan	20	17,784	38,891	496,037		8,325	
Lorain	½	25	349,055	668,343	404,057	68,600	2,815,877
Lucas			413,155	369,356			
Madison			6,274	402,686		650	
Mahoning			239,080	548,279	3,600	32,230	116,600
Marion	2	50	22,185	501,970			
Medina	57	121,656	7,395	705,343	18,903	133,242	338,247
Meigs	1	715	11,735	371,666		10,245	720
Mercer	3½	3,250	15,845	408,551		3,485	
Miami	740	748,490	69,385	533,676		13,620	
Monroe	2,108	1,656,748	3,665	483,710	12,149	104,505	549,067
Montgomery	8,663	8,650,055	292,108	738,830		800	
Morgan	681	569,908	13,368	483,655		1,550	
Morrow	19	2,960	11,531	561,392	150	340	15,000
Muskingum			194,974	858,847	4,100		
Noble	1,508	1,381,479	106	304,240		1,640	

TOBACCO, MILK, BUTTER, AND CHEESE.—Continued.

Counties.	Tobacco.		Milk.	Butter.		Cheese.	
	Acres planted.	Pounds produced.	Gallons sold for family use.	Pounds made in home dairies.	Pounds made in factories and creameries.	Pounds made in home dairies.	Pounds made in factories.
Ottawa.....			14,750	347,501			
Paulding.....			4,178	257,697			
Perry.....	9 ⁵ / ₈	10,826	7,502	478,647			
Pickaway.....	1 ¹ / ₂	800	26,210	373,012			
Pike.....	33 ³ / ₄	31,775	6,854	179,521			
Portage.....		25	494,882	630,331	260,689	7,868	2,808,761
Preble.....	1,501	1,710,825	23,585	523,115	2,800	450	
Putnam.....	3 ³ / ₈	75	66,640	527,976	8,000	22,925	
Richland.....	1 ¹ / ₂		116,686	754,354	325	8,286	
Ross.....	1 ¹ / ₄	685	33,440	364,499	300	13	12,000
Sandusky.....			27,750	549,169			
Scioto.....	8 ¹ / ₂	3,680	30,210	215,868		200	
Seneca.....	1	40	39,602	708,986	2,100		
Shelby.....	52	40,247	42,645	487,361		100	
Stark.....		200	332,039	1,013,303	37,360	56,681	448,040
Summit.....			694,538	626,850	284,332	203,715	978,778
Trumbull.....			85,311	746,040	202,353	131,472	2,447,295
Tuscarawas.....	1	90	159,831	642,925	13,350	131,650	475,519
Union.....		30	20,460	465,046		25	
Van Wert.....			68,870	458,287	12,163	72	
Vinton.....	42	12,610	11,125	234,186		100	
Warren.....	1,428	1,793,573	46,306	510,522		150	
Washington.....	1,456	1,193,091	32,498	688,418	15,000	6,800	
Wayne.....	124	143,256	323,070	960,975	172,400	58,948	80,000
Williams.....			16,455	552,434	102,040		141,000
Wood.....	3	2,700	51,180	773,700		58	
Wyandot.....	1 ¹ / ₈	300	184,285	391,900	23,825	35,170	28,000
Totals.....	35,462 ⁵ / ₈	33,113,822	14,605,551	48,376,698	2,393,121	1,563,089	17,304,274

SWEET POTATOES AND ORCHARDS.

Counties.	Sweet potatoes.		Orchards.			
	Acres planted.	Bushels produced.	Acres occupied.	Apples.—Bushels produced in 1885.	Peaches.—Bushels produced in 1885.	Pears.—Bushels produced in 1885.
Adams	38	2,847	4,433	187,968	194	3,436
Allen	6	268	3,336	17,566	127	250
Ashland	4	194	4,418	104,801	6	866
Ashtabula			6,052	587,385	79	2,298
Athens	16	842	5,392	136,515	2,077	922
Auglaize	2	78	2,326	20,718		587
Belmont	23	1,236	6,280	323,137	221	5,758
Brown	27	2,860	3,869	139,991	128	3,300
Butler	33	3,947	2,828	50,400	39	7,935
Carroll	1	103	4,739	303,928		1,731
Champaign	14	1,234	2,494	14,827		3,899
Clarke	33	2,552	2,050	54,978	43	4,866
Clermont	95	6,748	7,640	179,489	96	20,428
Clinton	29	3,175	2,333	99,678	35	5,012
Columbiana	1	20	7,884	515,913	38	3,227
Coshocton	5	166	5,955	122,770	22	615
Crawford	1	80	4,021	35,928	10	720
Cuyahoga	7	45	5,868	297,497	23	4,421
Darke	45	2,633	3,693	21,906	10	2,843
Defiance	1/2	40	3,208	101,131	3	453
Delaware	4	36	3,884	50,635	4	616
Erie	37	1,385	3,200	76,749		1,198
Fairfield	69	3,670	5,286	121,061	93	3,908
Fayette	10	1,051	1,926	56,142	151	2,363
Franklin	26	314	4,380	145,651	329	4,290
Fulton	5	234	5,075	87,333	300	220
Gallia	24	1,378	4,566	168,659	8,418	1,119
Geauga		15	4,092	279,107	66	1,949
Greene	33	3,535	2,941	117,766		5,433
Guernsey	3	148	4,876	149,925	111	1,778
Hamilton	171	14,314	4,274	125,397	350	31,887
Hancock	12	414	5,602	81,182	65	645
Hardin	4	109	3,233	49,573	219	927
Harrison	3	133	3,661	215,725	8	2,648
Henry	5	207	3,333	38,203	4	163
Highland	33	2,915	4,956	154,555	89	4,838
Hocking	41	3,844	3,826	66,970	38	464
Holmes	7	383	5,003	114,587	11	1,106
Huron	1	34	5,448	113,156		558
Jackson	7	435	3,116	112,270	2,850	388
Jefferson	5	80	4,459	300,437	94	3,540
Knox	5	191	4,520	33,557		1,076
Lake			2,701	107,580	12	799
Lawrence	54	5,116	7,384	153,071	8,783	511
Licking	17	366	6,225	56,864	146	2,948
Logan	5	397	2,708	24,603	4	1,477
Lorain	45	2,622	5,392	162,629	47	643
Lucas	2	100	3,428	48,028	4	1,254
Madison	3	318	1,791	45,717	4	1,311
Mahoning	3	59	4,658	350,640	45	3,713
Marion	2	152	2,758	43,927	15	512
Medina	8	180	4,412	197,554	20	606
Meigs	41	3,379	6,115	217,725	5,753	1,784
Mercer	11	197	2,520	34,803		325
Miami	27	2,944	1,855	12,039	14	3,448
Monroe	5	338	6,174	364,839	158	1,890
Montgomery	117	14,878	3,109	143,848	80	14,590
Morgan	21	2,662	5,795	112,203	1,167	2,403
Morrow	10	251	4,399	36,431	95	1,220
Muskingum	56	7,074	7,274	75,131	180	365
Noble	5	205	4,320	85,480	160	1,480

SWEET POTATOES AND ORCHARDS—Continued.

Counties.	Sweet potatoes.		Orchards.			
	Acres planted.	Bushels produced.	Acres occupied.	Apples.—Bushels produced in 1885.	Peaches.—Bushels produced in 1885.	Pears.—Bushels produced in 1885.
Ottawa.....			3,592	47,295	13	1,026
Paulding.....		91	1,588	34,797	3	102
Perry.....	23	1,511	3,672	43,219	28	1,754
Pickaway.....	22	1,405	2,543	101,640	337	1,485
Pike.....	15	1,040	3,360	166,639	336	718
Portage.....	1	77	5,950	373,468		1,302
Preble.....	49	3,236	2,084	16,287	55	6,501
Putnam.....	3	166	3,121	45,655	27	411
Richland.....	6	21	5,855	90,036	12	1,266
Ross.....	17	1,473	5,095	145,937	434	2,906
Sandusky.....	6	564	4,465	55,755	61	709
Scioto.....	79	3,866	2,888	109,079	468	1,086
Seneca.....	5	291	5,865	58,792		1,954
Shelby.....	2	157	2,016	11,694		681
Stark.....	7	739	7,083	496,493	211	4,691
Summit.....	2	233	4,342	214,012	6	1,547
Trumbull.....	2	86	5,377	486,001	43	2,171
Tuscarawas.....		223	6,973	352,979	24	2,267
Union.....		167	2,736	34,358		1,637
Van Wert.....	6	178	2,545	34,951		178
Vinton.....	17	1,325	3,006	78,984	1,157	498
Warren.....	71	5,013	3,562	92,546		12,807
Washington.....	229	26,131	10,446	354,108	3,562	3,274
Wayne.....	11	504	6,786	204,603	188	4,119
Williams.....	2	82	4,772	196,985	47	254
Wood.....	3	135	4,735	91,091	28	670
Wyandot.....	$\frac{1}{2}$	11	3,011	23,731		566
Totals.....	1,901	153,806	380,976	12,170,413	40,125	252,680

ORCHARDS AND LANDS OWNED.

Counties.	Orchards.		Lands owned.				Total number of acres owned.
	Cherries.—Bushels produced, 1885.	Plums.—Bushels produced, 1885.	Acres cultivated.	Acres pasture.	Acres woodland.	Acres lying waste.	
Adams	1,725	974	85,873	84,915	84,598	11,123	266,509
Allen	125		119,175	29,598	53,395	637	202,805
Ashland	4		130,947	47,607	45,157	3,128	226,819
Ashtabula	118	2	129,992	170,152	62,223	3,700	346,067
Athens	3,327	508	46,685	128,269	57,906	4,256	237,116
Auglaize	209	5	131,205	14,997	60,842	1,346	208,390
Belmont	442	79	112,269	136,301	81,396	8,684	338,650
Brown	1,405	449	107,303	97,015	42,553	9,666	257,037
Butler	2,147	78	149,560	28,864	29,874	8,788	217,996
Carroll	13	131	68,121	19,149	40,350	273	217,993
Champaign	182	156	164,602	34,213	62,669		261,482
Clarke	338	195	108,553	38,401	26,951	2,238	176,728
Clermont	4,312	107	117,644	65,150	31,265	13,662	127,521
Clinton	1,189	459	115,154	52,313	24,954	2,351	204,773
Columbiana	335	259	118,656	90,662	45,065	14,603	269,016
Coshocton	44	21	10,218	150,500	60,619	2,150	303,487
Crawford	11	1	135,500	32,056	41,324	857	209,537
Cuyahoga	64	11	110,462	73,740	24,634	8,937	217,823
Darke	268		214,522	23,247	12,333	7,207	317,509
Defiance	23	5	113,070	12,019	65,823	1,06	191,819
Delaware	17	6	108,277	98,488	43,371	1,069	251,145
Erie	20	20	78,912	26,658	11,825	3,941	114,316
Fairfield	2,669	3,931	130,721	93,071	42,405	5,258	271,055
Fayette	1,170	1,289	95,449	78,938	26,167	1,841	202,495
Franklin	59	456	151,162	55,106	32,799	6,521	245,522
Fulton	1	1	124,500	25,032	53,834	2,682	205,798
Gallia	2,378	390	69,775	86,978	48,880	6,298	212,131
Geauga	49	20	62,698	103,077	40,541	2,708	209,019
Greene	1,978	722	131,179	75,093	34,544	6,668	208,084
Guernsey	17	66	67,095	133,784	48,407	1,134	250,420
Hamilton	5,719	111	75,921	19,131	11,871	4,462	111,385
Hancock	264	12	178,010	45,636	76,068	1,678	301,392
Hardin	307	48	121,547	39,588	49,991	4,057	215,183
Harrison	44	42	46,155	123,427	36,184	454	206,220
Henry	12		97,578	5,894	49,393	1,450	154,315
Highland	3,239	1,827	129,868	123,836	61,103	3,294	318,101
Hocking	3,072	449	42,164	101,066	49,342	3,763	196,535
Holmes	8	2	123,941	76,388	59,756	5,083	265,168
Huron		20	142,559	78,337	39,021	4,195	264,312
Jackson	2,457	200	53,880	108,008	39,204	17,569	218,651
Jefferson	93	282	79,214	88,069	45,129	6,685	219,037
Knox	62	71	117,220	126,082	53,186	741	297,220
Lake			48,522	47,276	17,661	2,472	115,931
Lawrence	1,224	135	50,187	36,888	32,219	19,089	138,383
Licking	195	1,086	136,193	178,667	59,701	2,443	377,004
Logan	23	30	136,339	45,981	50,553	2,356	299,139
Lorain	6		119,970	104,935	38,314	1,604	264,819
Lucas	2		65,875	10,036	24,008	3,070	103,789
Madison	582	484	95,142	105,343	21,669	574	222,828
Mahoning	42	55	109,360	61,927	36,942	1,961	210,190
Marion	92	10	107,511	54,922	35,635	970	199,038
Medina	11		108,661	78,817	36,049	676	224,203
Meigs	3,288	1,099	61,297	94,959	52,553	4,702	213,511
Mercer	25		131,080	14,878	79,085	1,340	229,313
Miami	531	17	145,557	5,920	28,416	3,717	183,610
Monroe	1,068	110	85,417	98,169	63,189	9,246	256,021
Montgomery	2,518	155	174,147	15,560	42,363	7,773	239,943
Morgan	3,218	500	51,751	123,957	49,085	3,142	227,935
Morrow	4	4	72,213	112,755	62,534		247,502
Muskingum	523	277	101,605	243,623	70,378	2,817	418,423
Noble	366	55	68,052	125,671	42,578	1,312	278,623

ORCHARDS AND LANDS OWNED—Continued.

Counties.	Orchards.		Lands owned.				
	Cherries.—Bushels produced, 1885.	Plums.—Bushels produced, 1885.	Acres cultivated.	Acres pasture.	Acres woodland.	Acres lying waste.	Total number of acres owned.
Ottawa	1	264	62,884	16,954	27,209	7,704	114,751
Paulding	3	.....	55,313	3,156	57,199	5,637	121,305
Perry	1,556	1,079	64,868	92,115	34,415	2,370	193,768
Pickaway	893	1,506	145,503	84,697	35,593	6,818	272,311
Pike	1,434	446	58,894	50,167	75,921	6,546	191,528
Portage	5	7	134,109	122,158	53,281	6,118	315,666
Preble	680	44	162,104	41,527	41,347	17,063	262,041
Putnam	162	23	128,108	13,987	70,578	1,154	213,827
Rienland .....	.....	.....	179,646	45,219	57,149	4,125	286,139
Ross	1,838	3,386	140,258	103,611	64,399	17,771	326,038
San-tusky	9	3	187,123	17,318	38,372	3,468	196,281
Scioto	2,493	550	52,796	31,264	59,374	17,147	160,581
Seneca	19	4	204,906	33,026	60,235	1,279	299,446
Shelby	22	.....	186,992	30,012	34,286	2,199	253,409
Stark	118	52	207,573	50,692	42,500	5,681	306,086
Summit	20	12	123,144	56,664	24,413	6,766	210,987
Trumbull	109	30	114,003	143,131	61,036	3,563	321,733
Tuscarawas	41	30	136,287	112,866	56,143	8,067	313,363
Union	203	26	101,506	71,781	41,988	852	219,077
Van Wert	48	4	108,728	15,968	74,925	2,450	202,071
Vinton	2,054	232	51,062	102,212	76,847	29,500	259,821
Warren	2,201	242	129,062	29,684	33,356	4,857	196,959
Washington	4,022	407	111,387	135,741	89,676	7,503	344,507
Wayne	7	18	201,040	37,393	53,847	5,100	297,380
Williams	3	.....	132,543	30,169	59,801	1,728	224,241
Wood	87	2	161,288	31,358	77,936	948	261,530
Wyandot	127	18	116,452	52,894	37,489	3,008	209,843
Totals	72,647	23,625	9,791,834	6,171,897	4,258,767	444,843	20,876,283

WOOL, MILCH COWS, STALLIONS, DOGS, AND SHEEP.

Counties.	Wool.	Milch cows.	Stallions.	Dogs.	Sheep.			
	Pounds.	Number owned in 1885.	Number owned in 1885.	Total number.	Killed by dogs.		Injured by dogs.	
					Number.	Value.	Number.	Value.
Adams.....	76,311	4,403	24	1,336	268	\$601	117	\$307
Allen.....	103,654	5,628	62	878	176	612	179	551
Ashland.....	268,573	7,819	43	1,731	212	607	135	318
Ashtabula.....	114,555	17,292	66	1,650	197	678	69	120
Athens.....	580,983	4,251	20	1,641	389	949	90	157
Auglaize.....	72,295	5,941	36	1,722	138	383	83	132
Belmont.....	725,463	7,467	59	2,817	692	1,716	860	876
Brown.....	71,483	5,381	41	2,388	259	805	140	301
Butler.....	89,638	6,258	27	2,894	366	1,142	280	491
Carroll.....	62,599	6,068	45	278	713	165	323	
Champaign.....	195,008	4,831	58	2,074	382	907	273	174
Clarke.....	248,549	4,839	49	2,881	164	508	200	381
Clermont.....	33,608	6,129	35	2,833	253	972	115	193
Clinton.....	134,991	4,646	55	1,776	292	896	205	178
Columbiana.....	552,862	9,844	57	1,062	692	2,438	398	2,045
Coshocton.....	788,979	6,502	43	2,144	575	2,203	313	471
Crawford.....	245,572	6,401	40	2,394	386	1,059	241	382
Cuyahoga.....	62,241	12,486	45	1,693	181	602	202	312
Darke.....	18,257	9,364	52	2,783	19	655	182	263
Defiance.....	66,570	6,375	30	1,060	153	684	94	172
Delaware.....	606,665	5,907	54	100	346	904	235	423
Erie.....	144,942	3,891	29	320	47	240	21	59
Fairfield.....	146,192	7,371	43	3,043	230	883	101	164
Fayette.....	142,852	4,142	64	1,714	265	1,474	483	756
Franklin.....	129,908	7,796	52	928	557	1,854	160	286
Fulton.....	188,294	7,191	35	1,382	219	899	109	138
Gallia.....	71,194	4,560	31	2,363	350	779	344	860
Geauga.....	94,762	12,769	24	1,110	188	547	55	622
Greene.....	129,355	6,239	46	2,754	349	1,373	159	363
Guernsey.....	685,262	5,288	118	691	1,841	3,589	132	267
Hamilton.....	14,400	7,263	30	5,168	279	1,273	283	612
Hancock.....	246,939	8,186	50	2,655	309	806	28	458
Hardin.....	238,978	6,181	48	2,373	874	2,265	705	1,028
Harrison.....	904,935	4,955	55	1,280	424	1,052	406	683
Henry.....	35,124	5,293	17	1,699	195	479	117	265
Highland.....	102,803	6,355	47	2,317	517	1,407	291	583
Hocking.....	247,065	3,936	19	1,052	257	593	370	443
Holmes.....	202,016	7,056	52	1,786	315	1,009	235	437
Huron.....	369,323	8,291	44	1,649	264	621	259	1,692
Jefferson.....	44,482	4,252	14	1,177	475	1,266	158	181
Johnson.....	592,076	4,915	48	1,739	564	1,351	347	549
Knox.....	811,005	6,711	73	1,617	387	979	348	639
Lake.....	77,195	3,224	15	878	57	166	7	15
Lawrence.....	16,251	2,613	23	2,457	142	381	84	49
Licking.....	1,272,025	8,473	62	3,414	227	549	217	480
Logan.....	320,840	5,537	58	1,919	288	744	197	264
Lorain.....	174,030	15,947	44	2,088	308	969	168	379
Lucas.....	33,692	5,375	12	2,598	222	624	114	217
Madison.....	356,889	3,975	32	530	615	1,876	380	583
Mahoning.....	280,643	7,404	53	2,658	465	1,402	703	973
Marion.....	364,066	4,876	68	1,288	331	903	312	381
Medina.....	213,070	8,067	29	658	110	397	67	120
Meigs.....	295,119	4,884	14	507	382	855	240	302
Mercer.....	46,102	6,194	34	1,986	448	1,419	325	579
Miami.....	39,540	6,105	35	2,871	180	735	91	157
Monroe.....	227,286	8,239	28	2,437	214	571	126	209
Montgomery.....	17,840	8,604	35	1,872	366	318	135	224
Morgan.....	677,984	5,312	37	1,475	169	381	167	150
Morrow.....	705,931	5,405	50	1,459	637	1,109	526	771
Muskingum.....	889,207	8,444	39	1,174	547	1,180	300	455
Noble.....	527,292	5,310	29	1,910	278	688	140	266

WOOL, MILCH COWS, STALLIONS, DOGS, AND SHEEP.—Continued.

Counties.	Wool.	Milch cows.	Stallions.	Dogs.	Sheep.			
	Pounds.	Number owned in 1885.	Number owned in 1885.	Total number.	Killed by dogs.		Injured by dogs.	
					Number.	Value.	Number.	Value.
Ottawa.....	61,412	3,858	16	874	203	\$551	33	\$59
Paulding.....	21,873	3,498	31	1,528	163	352	82	108
Perry.....	382,045	4,598	21	2,140	766	1,984	331	588
Pickaway.....	42,986	5,260	46	2,852	299	1,044	151	334
Pike.....	39,507	2,592	21	1,611	176	544	55	80
Portage.....	170,191	13,396	41	2,222	126	428	97	266
Preble.....	32,217	4,964	40	2,186	253	1,099	117	253
Putnam.....	53,429	6,793	31	2,442	271	727	146	258
Richland.....	294,260	9,001	42	1,477	461	1,041	345	754
Ross.....	55,473	5,121	49	788	343	859	217	328
Sandusky.....	151,433	6,271	33	1,552	149	409	97	181
Scioto.....	11,170	2,875	6	348	303	550	32	46
Seneca.....	339,985	8,510	40	2,273	371	1,099	438	613
Shelby.....	63,529	6,169	49	2,278	330	940	97	171
Stark.....	178,053	12,490	62	4,593	288	891	299	364
Summit.....	93,635	10,989	52	2,249	200	667	374	496
Trumbull.....	263,098	15,971	129	2,572	253	793	306	519
Tuscarawas.....	417,833	11,360	45	2,850	440	1,207	398	613
Union.....	431,258	4,963	69	1,564	321	854	191	526
Van Wert.....	57,037	5,929	20	1,706	217	617	226	370
Vinton.....	244,276	2,514	12	1,008	262	662	246	410
Warren.....	83,317	5,080	31	1,450	296	1,012	98	199
Washington.....	541,968	7,759	35	3,133	464	1,036	286	501
Wayne.....	131,367	10,677	47	3,173	175	560	229	392
Williams.....	167,521	7,071	52	1,162	221	511	257	329
Wood.....	96,066	7,885	71	3,058	358	1,174	219	359
Wyandot.....	420,807	5,180	38	1,811	337	982	151	272
Totals.....	22,081,552	595,524	3,708	168,398	29,006	\$82,183	19,484	\$35,098

DOMESTIC ANIMALS DIED FROM DISEASES.

Counties.	Hogs.		Sheep.		Cattle.		Horses.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Adams	466	\$2,109	917	\$2,081	283	\$4,925	161	\$8,997
Allen	7,422	17,003	319	664	158	3,494	124	12,845
Ashland	314	1,316	1,373	2,874	284	6,200	125	14,545
Ashtabula	176	1,082	700	2,016	318	7,270	141	10,389
Athens	109	529	6,733	10,991	192	2,598	67	4,330
Auglaize	6,281	25,749	392	876	193	3,552	144	10,130
B. Belmont	293	1,344	7,110	12,201	362	7,814	170	10,745
B. own	856	3,105	868	2,210	242	5,070	163	11,177
Butler	4,303	20,393	538	2,395	344	9,032	320	18,687
Carroll	144	644	5,320	8,423	209	4,703	105	7,755
Champaign	5,436	22,210	513	1,331	191	4,989	148	15,565
Clarke	3,379	13,820	618	1,745	147	4,497	147	18,550
Clermont	675	2,626	706	1,728	199	4,722	142	8,032
Clinton	4,906	16,813	848	1,791	256	4,898	136	9,821
Columbiana	314	1,448	2,846	5,854	266	6,221	160	12,785
Coshocton	337	1,444	4,934	9,423	194	4,210	110	9,443
Crawford	839	3,396	647	1,477	227	4,245	149	10,860
Cuyahoga	316	1,954	557	1,196	232	7,132	179	13,376
Darke	7,778	34,872	168	570	532	11,235	277	21,520
Defiance	1,815	5,050	376	831	185	3,231	171	8,886
Delaware	359	1,582	3,294	6,298	202	4,568	171	16,446
Erle	144	644	585	1,161	190	3,872	56	4,745
Fairfield	789	3,585	593	1,292	286	5,936	149	11,262
Fayette	6,746	25,439	746	1,941	170	5,130	174	15,067
Franklin	8,375	39,682	1,645	4,035	559	10,530	324	26,660
Fulton	803	3,155	1,157	1,922	129	3,342	106	9,895
Galila	283	1,394	1,278	2,42	344	3,851	120	6,430
Geauga	147	1,115	675	1,618	265	6,290	79	5,570
Greene	5,567	25,386	747	1,919	291	6,418	193	18,580
Guernsey	113	629	7,842	12,539	196	3,970	100	6,227
Hamilton	1,472	6,594	161	605	367	9,864	208	12,965
Hancock	4,007	13,662	974	2,228	264	6,643	169	14,013
Hardin	1,611	6,510	1,381	2,949	305	5,102	177	12,774
Harrison	111	553	5,457	8,876	191	4,646	90	8,725
Henry	2,865	9,467	345	494	166	3,238	269	7,095
Highland	1,053	4,262	1,088	2,599	256	6,410	172	11,945
Hocking	258	1,112	3,399	5,412	210	3,119	75	5,437
Holmes	435	2,016	1,254	2,865	256	4,055	138	11,552
Huron	924	3,705	1,597	3,282	267	5,419	105	6,823
Jackson	135	620	569	1,106	308	4,688	101	5,172
Jefferson	149	780	5,243	9,570	163	3,674	112	8,355
Knox	1,299	4,755	7,135	11,638	193	3,965	134	11,644
Lake	73	223	511	1,039	57	1,345	39	2,965
Lawrence	269	1,162	422	614	253	3,171	91	4,427
Licking	422	2,257	14,229	26,462	350	8,792	270	19,917
Logan	3,945	15,466	1,803	4,270	290	4,396	160	13,820
Lorain	187	934	725	1,702	275	7,008	156	11,100
Lucas	1,487	5,619	344	588	145	3,116	122	8,030
Madison	8,433	31,451	1,540	4,400	247	6,941	232	21,716
Mahoning	153	822	925	2,011	189	4,383	118	9,168
Marion	946	3,775	1,480	3,200	246	4,485	167	15,780
Medina	184	917	699	2,075	214	4,438	90	7,350
Meigs	186	841	4,069	5,708	204	3,050	174	9,750
Mercer	2,769	7,487	177	490	268	4,700	152	11,750
Miami	1,719	8,323	282	989	304	8,059	191	16,680
Monroe	328	1,436	5,270	8,985	330	5,523	127	6,779
Montgomery	4,644	26,452	241	812	435	8,843	256	20,225
Morgan	154	665	8,758	13,960	185	3,746	107	7,145
Morrow	253	1,121	4,816	6,172	147	3,325	107	9,565
Muskingum	2,213	1,173	5,583	9,731	257	5,469	149	9,078
Noble	121	577	6,362	10,043	196	3,464	115	6,591
Ottawa	393	1,185	170	362	192	3,778	92	6,154
Paulding	619	2,369	244	638	241	4,222	156	8,570
Perry	222	987	3,378	6,593	145	2,329	101	5,340
Pickaway	5,994	25,261	212	519	216	5,905	203	16,470
Pike	516	1,657	642	1,340	128	2,439	152	7,145
Portage	207	1,178	820	2,182	256	7,857	144	12,439
Preble	4,567	19,679	382	1,276	275	4,761	144	12,537
Putnam	6,861	25,902	477	1,325	286	6,171	155	13,593

DOMESTIC ANIMALS DIED FROM DISEASES—Continued.

Counties.	Hogs.		Sheep.		Cattle.		Horses.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Richland.....	416	\$1,604	1,714	\$3,295	238	\$5,030	186	\$17,425
Ross.....	4,771	17,292	410	1,091	195	4,799	169	11,140
Sandusky.....	663	2,612	508	1,201	199	3,972	119	10,201
Scioto.....	279	1,871	219	4-3	219	3,5-2	194	5,491
Seneca.....	796	3,284	788	1,773	240	5,280	148	13,997
Shelby.....	4,005	14,213	426	1,066	292	5,824	173	14,207
Stark.....	515	2,665	1,139	2,608	402	8,124	217	19,550
Summit.....	364	1,747	558	1,512	287	6,769	178	12,450
Trumbull.....	162	1,032	1,585	3,354	323	7,291	150	8,863
Tuscarawas.....	318	1,416	3,481	6,210	366	5,559	165	11,873
Union.....	1,241	5,690	3,191	6,395	170	4,438	184	19,475
Van Wert.....	1,744	6,046	336	692	251	5,584	148	1,258
Vinton.....	27	165	2,755	4,917	126	2,415	37	1,740
Warren.....	3,627	16,613	797	2,166	373	6,896	137	10,541
Washington.....	317	1,575	6,905	12,554	372	5,572	163	9,275
Wayne.....	588	2,701	720	2,331	346	8,680	179	19,9-4
Williams.....	1,008	3,616	416	950	142	3,495	80	6,605
Wood.....	1,223	4,326	796	1,645	292	5,903	237	16,075
Wyandot.....	481	2,415	1,685	3,603	202	4,558	98	7,520
Totals.....	174,114	\$116,223	176,748	\$332,140	21,618	\$460,805	13,184	\$986,338

SORGHUM AND MAPLE.

Counties.	Sorghum.			Maple.		
	Acres planted.	Pounds of sugar.	Gallons of syrup.	Pounds of sugar.	Gallons of syrup.	Number of trees tapped.
Adams	253		19,491	1,096	2,609	9,777
Allen	97	61	5,430	1,734	6,149	21,404
Ashland	20	25	1,786	57,850	16,506	94,794
Ashtabula	21 $\frac{1}{2}$		199	253,837	21,00	254,475
Athens	114	2	9,237	1,588	1,154	4,540
Auglaize	348		22,414	785	4,058	27,492
Belmont	210	90	24,087	179	1,542	3,564
Brown	214	4	14,931	1	956	1,410
Butler	42		4,379	415	1,878	7,150
Carroll	55		4,510	600	482	1,722
Champaign	106		8,143	15,077	7,414	30,461
Clarke	62		7,891	792	84	395
Clermont	242		15,351	130	936	3,592
Clinton	93		8,330	5,084	9,023	28,883
Columbiana	20		1,500	8,753	16,931	73,005
Coshocton	54		4,973	60	801	2,428
Crawford	82		5,764	2,365	9,555	36,751
Cuyahoga	7	181	561	85,718	49,242	19,185
Darke	431		49,559	289	5,271	24,418
Defiance	103		12,501	1,401	2,299	9,394
Delaware	38	110	4,015	916	16,084	54,503
Erie	7		546	4,507	1,647	8,918
Fairfield	160		14,862	1,457	5,180	16,736
Fayette	29	503	3,860	60	384	542
Franklin	55		6,307	293	563	1,779
Fulton	47	86	4,691	953	1,163	4,620
Gallia	740	1,588	107,488	792	2 2	1,103
Geauga				631,760	31,609	374,156
Greene	55	7	4,593	4,960	6,095	28,533
Guernsey	274		32,699	10	178	177
Hamilton	24	450	1,636	32	1,456	
Hancock	44		4,051	2,780	15,448	60,063
Hardin	60	90	4,611	1,441	3,457	15,995
Harrison	65	6	6,848	195	1,965	6,517
Henry	141		13,009	110	525	1,331
Highland	253		18,751	1,123	3,462	11,534
Hocking	128		12,415	310	415	846
Holmes	33		2,590	2,908	2,386	8,662
Huron	68		3,705	28,492	13,518	69,672
Jackson	236		18,453		38	155
Jefferson	94		8,268	43	4,900	9,634
Knox	17		1,579	17,284	14,280	44,681
Lake				31,970	4,979	38,449
Lawrence	908		115,246	305	9	239
Licking	61	1	7,188	4,165	14,875	59,984
Logan	55		5,951	136,171	37,484	119,324
Lorain	34		4,566	56,553	12,469	85,292
Lucas	20		1,563	545	209	187
Madison	6		532			
Mahoning	8		324	35,407	30,807	118,891
Marion	36	2	3,055	514	1,193	4,319
Medina	1 $\frac{1}{8}$		62	99,642	35,173	163,624
Meigs	281		15,541	921	539	2,040
Mercer	303		25,601	103	59	65
Miami	211		23,705	752	5,448	24,444
Monroe	545		43,169	1,762	213	1,783
Montgomery	242		25,393	725	6,714	35,460
Morgan	209		16,328	154	505	1,679
Morrow	19		1,599	23,023	24,565	81,121
Muskingum	151	100	11,872	238	828	1,678
Noble	383		35,040	178	347	705

SORGHUM AND MAPLE—Continued.

Counties.	Sorghum.			Maple.		
	Acres planted.	Pounds of sugar.	Gallons of syrup.	Pounds of sugar.	Gallons of syrup.	Number of trees tapped.
Ottawa.....	58	51	2,174	270	316	277
Faulding.....	251	.....	8,209	344	321	1,105
Perry.....	89	.....	8,367	2,040	5,409	12,052
Pickaway.....	31	.....	3,279	100	792	2,396
Pike.....	308	.....	23,611	889	1,042	3,646
Portage.....	2	.....	119	116,376	78,346	334,937
Preble.....	236	41	21,594	258	5,303	21,086
Putnam.....	176	7	12,992	416	1,870	517
Richland.....	27	.....	1,937	20,257	25,660	138,040
Ross.....	160	.....	12,886	255	3,077	9,212
Sandusky.....	4 ¹ / ₂	.....	4,948	9,494	1,245	2,169
Scioto.....	33 ¹ / ₂	.....	29,328	48	36	15
Seneca.....	70	.....	6,148	4,162	9,716	51,030
Shelby.....	327	.....	27,502	320	1,842	7,309
Stark.....	50 ³ / ₄	30	1,949	7,689	11,993	53,803
Summit.....	2	.....	246	25,402	13,217	58,228
Trumbull.....	9	.....	604	188,594	142,022	54,971
Tuscarawas.....	82	.....	6,608	502	1,030	2,427
Union.....	67	.....	6,370	28,441	10,687	54,733
Van Wert.....	106	.....	9,391	42	244	630
Vinton.....	197	.....	16,453	2,630	858	3,015
Warren.....	51	I	5,985	2,392	3,270	12,605
Washington.....	580	.....	50,175	92	390	1,126
Wayne.....	20	.....	2,065	14,335	9,184	41,964
Williams.....	59	.....	6,146	0,259	7,229	38,196
Wood.....	147	.....	10,557	874	4,009	9,573
Wyandot.....	35	60	2,374	673	3,621	15,266
Totals.....	12,119	3,496	1,113,140	1,967,467	801,610	3,048,561

BEES, EGGS, GRAPES, AND WINE.

Counties.	Bees.		Eggs.		Grapes and wine.			
	Number hives.	Pounds honey.	Number of dozen produced.	Number dozen shipped beyond State.	Acres planted in 1885.	Whole number of acres in vineyards in 1885.	Pounds of grapes gathered in 1885.	Gallons wine pressed in 1885.
Adams.....	1,630	10,672	426,287	37,000	1	1	4,600	.....
Allen.....	979	12,379	449,526	.....	6	12	1,810	.....
Ashland.....	703	7,223	218,162	1,000	.....	8	4,325	25
Ashtabula.....	1,682	33,660	389,666	81,140	32	109	206,350	195
Athens.....	900	4,588	306,460	30,557	.....	2	2,300	140
Auglaize.....	639	5,791	544,082	441,976	.....	.....	.....	.....
Belmont.....	1,527	6,400	481,778	442	24	168	229,360	1,850
Brown.....	1,299	7,694	476,615	.....	.....	241	10,185	4,140
Butler.....	1,817	5,052	486,497	.....	.....	42	12,792	1,791
Carroll.....	369	1,008	297,693	18,610	1	3	7,115	36
Champaign.....	1,027	12,994	477,916	14,240	8	1,254	3,800	10
Clermont.....	1,108	13,719	319,628	.....	1	12	19,250	530
Clermont.....	1,048	3,794	48,445	12,580	7	342	341,370	8,460
Columbiana.....	1,175	3,617	371,346	265	3	3	19,980	5
Coshocton.....	970	9,525	544,040	11,622	205	214	14,765	423
Crawford.....	590	4,167	502,676	44,850	12	13	13,400	.....
Cuyahoga.....	1,006	12,520	560,889	77,365	1	1	570	30
Darke.....	991	17,820	353,663	50	579	3,599	3,390,363	5,792
Defiance.....	1,244	19,363	867,493	150	3	5	4,860	.....
Delaware.....	1,334	15,675	454,916	41,400	1 1/4	2	4,790	360
Erie.....	739	9,387	562,725	806	3	1,031	225	.....
Fairfield.....	505	6,470	197,245	500	92	3,082	1,571,045	71,170
Fayette.....	709	1,471	653,532	39,000	7	108	54,952	379
Franklin.....	1,124	1,285	323,588	.....	45	56	14,316	247
Fulton.....	971	2,152	596,119	150	25	32	25,105	110
Gallia.....	238	4,746	446,092	32,000	4	4	1,100	110
Geauga.....	1,247	1,270	307,374	40	8	8	4,370	17
Greene.....	647	14,191	277,169	144	17	1,619	31,891	.....
Guernsey.....	1,367	7,864	477,458	150,000	3	4	7,480	522
Hamilton.....	665	1,945	422,722	.....	2	29	14,565	94
Hancock.....	912	4,820	328,980	98	25	240	313,876	13,070
Harrison.....	1,731	19,975	637,390	.....	5	9	12,119	5
Hardin.....	1,887	30,407	487,160	.....	2	3	7,045	40
Henry.....	486	1,437	324,205	15,000	1	3	3,859	3
Highland.....	369	4,280	418,508	34,275	1	4	2,310	13
Hocking.....	1,327	2,211	594,208	.....	2	2	23,270	185
Holmes.....	586	2,064	275,186	.....	1 1/4	73 1/2	21,355	398
Huron.....	815	6,061	539,628	2,000	1 1/4	18 1/2	13,869	1,163
Jackson.....	915	19,659	417,714	40,025	1	6	5,600	126
Jefferson.....	393	1,497	257,747	.....	.....	.....	2,510	1
Jones.....	722	2,385	332,015	460	3	4	8,770	208
Knox.....	706	4,833	679,472	1,500	2	23	11,072	26
Lake.....	596	12,216	94,770	.....	243	561	490,800	9
Lawrence.....	989	3,341	139,185	5,705	.....	1	645	10
Licking.....	1,076	4,983	781,130	323,544	.....	3	15,070	.....
Logan.....	1,433	16,965	442,893	.....	1	1	330	1
Lorain.....	1,042	16,962	441,741	1,200	20	527	322,302	477
Lucas.....	435	13,515	259,127	.....	15	271	190,550	3,942
Madison.....	844	235	398,545	5,850	13 1/4	33 1/4	24,975	210
Mahoning.....	1,092	20,095	294,208	100	2 1/4	21 1/4	3,065	.....
Marion.....	900	9,076	652,596	800	1	15 1/2	1,672	.....
Medina.....	719	14,875	329,912	.....	.....	5	755	.....
Meigs.....	814	761	372,638	200	12	17	26,660	412
Mercer.....	876	11,309	564,676	42,500	1 1/2	10 1/2	1,360	.....
Miami.....	1,241	26,916	417,367	.....	1	3	2,430	.....
Monroe.....	931	6,562	546,268	193,854	2 1/2	18 1/2	35,810	1,236
Montgomery.....	1,082	14,978	579,318	.....	3	37	98,152	496
Morgan.....	897	1,911	537,263	25,090	1 3/4	16 1/4	12,470	282
Morrow.....	905	9,780	468,390	100	1	50	200	.....
Muskingum.....	686	2,812	574,713	34,407	3	45	66,754	1,202
Noble.....	410	298	477,682	53,700	.....	3	4,700	66

BEES, EGGS, GRAPES, AND WINE.—Continued.

Counties.	Bees.		Eggs.		Grapes and wine.			
	Number hives.	Pounds honey.	Number of dozen produced.	Number dozen shipped beyond State.	Acres planted in 1885.	Whole number of acres in vineyards in 1885.	Pounds of grapes gathered in 1885.	Gallons wine pressed in 1885.
Ottawa.....	54	12,937	198,222	.....	170	2,641	1,135,967	310,239
Paulding.....	251	4,265	186,253	.....	2	2	400	.....
Perry.....	382	775	376,220	1	23	154 $\frac{1}{2}$	28,742	.....
Pickaway.....	724	1,192	424,683	11,400	.....	17 $\frac{3}{4}$	4,200	.....
Pike.....	665	2,895	219,636	800	7 $\frac{1}{4}$	14 $\frac{1}{4}$	7,600	147
Portage.....	1,226	19,002	435,961	290,004	.....	.....	1,990	.....
Preble.....	922	7,634	406,167	1,160	1	4	20,180	186
Putnam.....	611	4,564	601,398	109,250	1 $\frac{1}{4}$	.....	1,980	25
Richland.....	789	30,356	604,521	63,490	.....	10 $\frac{1}{4}$	2,940	.....
Ross.....	1,181	2,844	345,177	1,900	16 $\frac{1}{2}$	88 $\frac{3}{4}$	34,685	1,467
Sandusky.....	314	12,492	399,157	35,360	1 $\frac{1}{6}$	25 $\frac{1}{2}$	12,770	.....
Scioto.....	1,076	7,414	160,025	.....	14	14	64	1,510
Seneca.....	869	10,505	611,835	.....	.....	17	19,601	358
Shelby.....	1,304	19,544	575,348	31,200	.....	5 $\frac{1}{8}$	1,882	.....
Stark.....	828	9,052	625,328	24,714	1	33 $\frac{1}{2}$	34,034	688
Summit.....	762	12,815	316,630	.....	.....	3	15,425	74
Trumbull.....	1,425	19,346	345,104	.....	22	33	17,615	90
Tuscarawas.....	602	2,158	537,434	6,760	17	18	6,770	755
Union.....	1,070	7,350	561,928	22,731	.....	.....	2,495	26
Van Wert.....	927	9,025	398,767	139,575	.....	.....	645	.....
Vinton.....	370	1,826	209,857	5,000	.....	3	2,100	20
Warren.....	833	2,365	352,631	180	.....	6	7,520	440
Washington.....	1,163	3,230	577,745	403,720	102	152	13,291	2,634
Wayne.....	741	8,811	660,717	169,814	8 $\frac{1}{4}$	26	51,170	1,001
Williams.....	719	10,640	610,204	225,000	1	5	5,131	40
Wood.....	945	37,439	594,561	.....	5	44	17,520	.....
Wyandot.....	819	11,611	395,461	18,100	2 $\frac{1}{2}$	7	4,500	.....
Totals.....	79,589	818,068	38,420,451	3,588,248	1,894 $\frac{1}{2}$	17,292	9,043,216	439,610

LOSSES BY FLOODS.

Counties.	Value of live stock.	Value of grain, etc.	Value of horses, etc.	Value of fences, etc.
Adams				\$50 00
Allen				
Ashland				
Ashtabula		\$150 00		15 00
Athens				
Auglaize				
Belmont			\$2,010 00	12 00
Brown				
Butler	\$145 00			
Carroll		14 00		
Champaign				
Clarke				
Clermont				
Clinton				
Columbiana				
Coshocton				
Crawford	90 00			10 00
Cuyahoga		320 00		10 00
Darke	7 00	345 00		
Defiance		150 00		50 00
Delaware		240 00		
Erie				
Fairfield		750 00		100 00
Fayette				
Franklin				
Fulton				
Gallia		115 00		35 00
Geauga				
Greene				
Guernsey				
Hamilton				
Hancock				
Hardin				
Harrison				
Henry				
Highland		10 00		10 00
Hocking				10 00
Holmes				
Huron				
Jackson				
Jefferson				
Knox		150 00		50 00
Lake		100 00		
Lawrence				
Licking	420 60	4,638 00	240 00	1,740 00
Logan				5 60
Lorain				
Lucas				
Madison		35 00	1,350 00	
Mahoning				
Marion				
Medina				
Meigs		100 00		
Mercer				
Miami				
Monroe		75 00		
Montgomery		465 00	350 00	485 00
Morgan		70 00		20 00
Morrow				
Muskingum		10 00		
Noble				
Ottawa				
Paulding				
Perry				
Pickaway		600 00		

LOSSES BY FLOODS—Continued.

Counties.	Value of live stock.	Value of grain, etc.	Value of horses, etc.	Value of fences, etc.
Pike		\$12 00		\$100 00
Portage		50 00		
Preble				
Putnam				
Richland		250 00		
Ross		28 00		41 00
Sandusky				
Scioto		80 00		
Seneca				
Shelby				
Stark	\$295 00	420 00		75 00
Summit				
Trumbull				
Tuscarawas		110 00		505 00
Union				50 00
Van Wert				15 00
Vinton				
Warren		5 00		
Washington		772 00		
Wayne		115 00		
Williams				
Wood				
Wyandot				
Totals	\$957 00	\$10,189 00	\$3,950 00	\$3,388 00

TABULAR STATEMENT EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC., SHEEP AND HOGS RETURNED TO THE AUDITOR OF STATE'S OFFICE BY THE SEVERAL COUNTY AUDITORS, FOR THE YEARS 1885 AND 1886.

Counties.	Number of horses.		Number of cattle.		Number of sheep.		Number of hogs.		Number of mules.	
	1885.	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.	1886.
Adams	5,520	5,545	14,042	13,424	17,873	15,101	12,908	11,674	262	278
Allen	7,911	8,240	17,664	17,954	30,338	28,765	27,510	26,848	231	233
Ashtand	7,610	8,333	20,753	20,753	58,317	52,158	19,274	19,975	93	95
Ashtabula	9,959	10,601	37,150	37,118	28,432	25,936	5,332	5,990	46	49
Athens	4,559	4,637	14,027	12,913	18,452	96,895	5,456	5,037	303	297
Auglaize	7,666	7,575	15,929	17,493	19,703	15,138	20,920	22,781	290	304
Belmont	9,514	9,758	22,730	21,559	18,121	141,535	16,269	13,168	430	421
Bell	7,542	7,854	18,717	17,196	17,196	13,110	19,991	20,013	279	280
Brown	10,438	10,744	18,817	20,011	16,394	8,055	26,246	28,568	987	987
Butler	5,673	5,965	14,118	20,011	16,394	128,020	9,143	9,627	143	152
Carroll	10,365	10,389	16,891	17,039	33,305	31,700	24,375	24,604	198	189
Clarke	9,956	9,990	16,797	18,510	33,305	53,663	20,231	21,093	408	380
Clemont	7,648	8,403	13,911	15,061	10,691	8,904	17,757	16,176	681	747
Clinton	9,204	9,215	16,771	17,584	33,024	33,446	38,810	37,751	347	394
Columbiana	9,890	10,373	21,998	23,129	121,872	101,318	14,282	14,719	235	213
Coshocton	7,044	6,963	18,805	18,747	151,943	126,919	15,973	14,987	212	186
Crawford	8,514	8,333	19,510	19,437	61,642	51,122	29,876	27,885	170	169
Cuyahoga	18,983	19,287	24,085	22,867	16,114	13,828	5,303	4,488	596	358
Darke	13,548	13,619	25,517	26,814	6,671	5,789	36,977	36,109	419	445
Defiance	5,829	5,702	15,714	14,793	16,435	14,571	14,571	15,571	156	148
Delaware	9,089	9,349	19,726	20,560	107,895	97,419	17,670	19,086	124	180
Erie	5,741	5,740	9,476	9,139	25,221	25,221	8,943	8,334	59	33
Fairfield	9,620	9,576	23,418	23,787	30,391	25,783	82,538	30,740	132	121
Fayette	8,359	8,846	18,329	20,108	29,025	27,214	33,958	36,215	462	364
Franklin	16,279	16,546	25,895	26,025	32,012	29,137	32,437	28,689	356	313
Fulton	7,326	7,226	15,404	16,187	40,922	37,212	16,315	20,753	124	115
Gallia	5,394	5,553	16,985	15,318	21,531	17,305	10,771	8,846	328	337
Geauga	5,100	5,367	24,357	23,337	24,537	21,544	3,590	3,549	25	35
Greene	10,703	10,497	18,986	19,831	33,411	30,191	30,776	31,137	302	302
Guernsey	6,104	6,427	16,089	15,856	102,610	147,787	8,594	7,954	182	226
Hamilton	18,901	19,556	23,899	23,918	7,012	5,598	18,036	16,078	2,350	2,440
Hancock	9,770	9,578	23,274	24,864	50,232	46,093	38,438	42,286	198	205
Hardin	7,572	8,128	18,109	19,588	53,171	49,634	23,711	27,539	225	291
Harrison	6,029	6,029	12,515	12,660	185,889	162,914	7,370	7,885	75	82
Henry	5,624	5,624	12,443	13,042	11,598	9,622	15,448	16,571	182	178
Highland	9,592	9,734	22,878	22,878	25,134	23,495	35,396	31,750	352	341
Hocking	3,101	3,446	10,186	10,486	7,533	45,048	7,533	6,569	154	165
Holmes	9,047	9,147	16,371	17,514	42,096	37,155	19,125	18,627	148	152
Huron	9,047	9,147	16,371	17,514	42,096	37,155	19,125	18,627	96	92
Jackson	3,515	3,422	17,016	13,999	15,193	67,599	14,285	6,305	486	513
Jefferson	6,034	6,318	18,826	13,452	120,124	109,675	6,791	8,067	212	220
Knox	9,260	9,314	19,652	20,070	160,994	142,347	20,290	20,152	128	143

	4,060	4,070	10,185	9,653	22,898	19,720	2,224	1,992	43	37
Iake.....	3,893	3,833	12,240	12,592	7,591	6,410	8,732	7,185	778	803
Lawrence.....	11,979	12,402	26,197	24,152	297,464	208,855	21,947	22,723	141	157
Licking.....	9,408	9,335	19,335	19,754	30,550	34,738	22,39	21,008	239	212
Logan.....	10,077	10,168	23,342	23,342	30,550	34,738	22,39	21,008	50	40
Lorain.....	7,468	7,468	9,551	9,466	70,918	7,833	7,974	8,019	124	183
Lu-ss.....	8,032	8,032	2,405	2,405	70,918	7,833	28,261	27,270	259	286
Madison.....	8,300	8,300	20,437	20,437	76,762	55,034	9,168	8,181	186	169
Maohing.....	7,735	7,735	16,411	16,411	53,578	68,912	23,141	29,255	2.5	150
Marion.....	8,805	8,805	21,880	21,880	61,433	51,378	9,162	9,539	97	104
Medina.....	5,232	5,232	13,583	13,583	12,552	6,978	6,978	5,415	376	413
Meigs.....	7,961	7,961	17,827	17,827	12,552	9,089	29,583	34,466	198	198
Mercer.....	10,928	10,928	15,353	15,353	48,101	8,227	18,087	17,016	370	356
Mind.....	5,416	5,416	17,031	17,031	48,101	8,227	29,583	34,466	24	24
Monroe.....	5,277	5,277	15,353	15,353	48,101	8,227	18,087	17,016	193	193
Montgomery.....	14,051	14,051	21,203	21,203	48,101	8,227	9,125	23,093	372	430
Morgan.....	5,793	5,793	15,032	15,032	130,112	119,307	8,369	7,296	107	110
Morrow.....	7,752	7,752	16,033	16,033	134,913	109,018	12,769	13,154	101	116
Muskingum.....	10,751	10,751	27,501	27,501	182,859	163,377	15,570	14,311	382	356
Noble.....	5,977	5,977	16,222	16,222	10,572	96,502	10,417	8,312	134	125
Ottawa.....	5,866	5,866	16,222	16,222	10,572	96,502	10,417	8,312	134	125
Paulding.....	5,866	5,866	16,222	16,222	10,572	96,502	10,417	8,312	134	125
Perry.....	5,866	5,866	16,222	16,222	10,572	96,502	10,417	8,312	134	125
Pickaway.....	4,169	4,169	16,397	16,397	10,572	96,502	10,417	8,312	134	125
Pike.....	4,183	4,183	16,397	16,397	10,572	96,502	10,417	8,312	134	125
Portage.....	8,086	8,086	16,397	16,397	10,572	96,502	10,417	8,312	134	125
Preble.....	9,342	9,342	16,397	16,397	10,572	96,502	10,417	8,312	134	125
Putnam.....	6,928	6,928	16,397	16,397	10,572	96,502	10,417	8,312	134	125
Richland.....	10,975	10,975	22,402	22,402	16,397	10,572	96,502	10,417	148	158
R. ss.....	10,975	10,975	22,402	22,402	16,397	10,572	96,502	10,417	148	158
Sandusky.....	8,051	8,051	17,159	17,159	23,901	30,661	19,932	26,528	148	148
Seneca.....	4,513	4,513	12,759	12,759	6,519	6,036	9,212	7,650	85	848
Shelby.....	10,491	10,491	18,000	18,000	67,010	60,710	32,213	34,605	163	176
Shelby.....	13,565	13,565	20,326	20,326	13,722	10,918	17,334	19,110	165	153
Stark.....	10,659	10,659	24,919	24,919	47,524	46,190	26,157	55,219	358	342
Summit.....	11,657	11,657	24,919	24,919	47,524	46,190	26,157	55,219	358	342
Tuscarawas.....	8,476	8,476	24,919	24,919	47,524	46,190	26,157	55,219	358	342
Union.....	8,476	8,476	24,919	24,919	47,524	46,190	26,157	55,219	358	342
Van Wert.....	8,501	8,501	14,573	14,573	91,117	82,558	6,987	7,001	102	104
Vinton.....	2,689	2,689	14,573	14,573	91,117	82,558	6,987	7,001	102	104
Warren.....	9,323	9,323	15,293	15,293	13,111	13,029	22,162	27,059	119	116
Washington.....	7,517	7,517	15,293	15,293	13,111	13,029	22,162	27,059	294	306
Wayne.....	11,078	11,078	27,059	27,059	51,201	47,418	8,256	3,185	553	265
Williams.....	6,918	6,918	27,059	27,059	51,201	47,418	8,256	3,185	498	528
Wood.....	9,782	9,782	16,881	16,881	99,788	100,035	10,868	9,457	263	257
Wyandot.....	7,282	7,282	16,881	16,881	99,788	100,035	10,868	9,457	243	243
Totals.....	726,108	725,814	1,631,376	1,637,110	4,828,922	4,277,463	1,600,971	1,505,373	24,386	24,378

VALUATIONS FOR TAXATION OF HORSES, CATTLE, MULES, SHEEP, AND HOGS
FOR 1884 AND 1885.

	1884.		1885.	
	Number.	Value.	Number.	Value.
Horses	736,191	\$45,692,292	724,975	\$44,501,695
Cattle	1,608,228	31,354,217	1,625,573	29,490,185
Mules.....	24,472	1,621,274	24,302	1,514,501
Sheep	4,968,794	11,940,720	4,928,332	9,845,819
Hogs	1,801,599	6,467,036	1,603,261	4,942,219

COMPARATIVE TABLE, EXHIBITING THE NUMBER OF BUSHEL OF WHEAT AND CORN PRODUCED ANNUALLY, FROM 1850 TO 1886, INCLUSIVE.

Year.	Bushels of wheat.	Average number of bushels to acre.	Bushels of corn.	Average number of bushels to acre.
1850	31,500,000	18.	56,619,608	36.8
1851	25,304,225	15.2	61,171,282	36.7
1852	23,043,757	14.1	58,165,517	33.6
1853	17,118,311	12.	73,436,070	40.
1854	11,989,110	8.	52,171,551	26.
1855	19,569,320	13.81	87,587,434	39.7
1856	15,393,857	10.2	57,802,515	27.7
1857	25,397,614	14.	82,555,186	36.6
1858	17,655,483	10.4	50,863,582	27.7
1859	13,317,967	7.2	68,730,846	29.5
1860	23,640,356	13.8	91,588,704	38.2
1861	20,053,424	11.	74,858,878	33.5
1862	20,764,887	12.	62,704,887	30.
1863	20,452,410	11.36	54,614,617	27.
1864	15,541,385	9.33	51,053,491	27.
1865	13,244,139	9	68,053,668	35.
1866	5,824,747	4.50	80,386,320	36.5
1867	13,350,726	11.51	63,875,064	29.8
1868	16,380,059	11.31	76,725,288	34.4
1869	26,499,729	15.37	62,443,346	28.4
1870	18,726,341	11.29	88,565,299	37.5
1871	22,274,378	13.27	98,363,060	36.7
1872	18,987,664	11.22	103,053,234	40.9
1873	21,974,385	12.61	84,049,328	35.1
1874	26,896,818	14.51	101,815,494	39.8
1875	17,867,967	9.22	97,825,024	34.1
1876	15,354,569	10.18	112,552,642	36.8
1877	27,306,566	15.63	101,884,105	32.5
1878	35,218,783	16.58	114,839,127	37.8
1879	41,032,120	17.78	96,908,800	34.
1880	48,540,307	17.20	105,414,594	38.9
1881	38,102,633	13.40	78,712,796	31.
1882	42,112,403	15.59	90,869,137	34.
1883	27,169,738	10.67	64,001,618	24.2
1884	36,396,119	14.4	87,797,813	33.3
1885	24,183,430	9.8	112,192,744	39.0
1886 (October estimate)	40,566,868	15.2	.....	.....

WHEAT AVERAGE.

Average per acre of first term of nine years..... 12.86; average total..... 20,754,000 bushels.
 Average per acre of second term of nine years..... 9.86; average total..... 17,245,000 bushels.
 Average per acre of third term of nine years..... 12.11; average total..... 20,462,000 bushels.
 Average per acre of the term of 27 years 11.61; average total..... 19,487,000 bushels.
 Average per acre of last seven years, up to 1883..... 16.14; average total..... 29,638,000 bushels.
 Average per acre of last four years, including estimate for 1886, 11.84; average total, 30,307,337.

APPENDIX.

NINETEENTH ANNUAL REPORT

OF THE

OHIO STATE

HORTICULTURAL SOCIETY,

For the Year 1885-86.

[ORGANIZED IN 1847, AS OHIO POMOLOGICAL SOCIETY.]

OFFICERS OF THE SOCIETY FOR 1885-86.

N. OHMER, Dayton	<i>President.</i>
H. Y. BEEBE, Ravenna,	<i>Vice-President.</i>
GEORGE W. CAMPBELL, Delaware,	<i>Secretary.</i>
J. J. HARRISON, Painesville,	<i>Treasurer.</i>

AD INTERIM COMMITTEE, WITH ABOVE OFFICERS.

R. H. WARDER,	North Bend, Hamilton Co.
A. F. NEWELL,	Warren, Trumbull Co.
S. H. HURST,	Chillicothe, Ross Co.
MATTHEW CRAWFORD,	Cuyahoga Falls, Summit Co.
W. W. FARNSWORTH,	Waterville, Lucas Co.
W. J. GREEN,	Columbus, Franklin Co.
E. H. CUSHMAN,	Euclid, Cuyahoga Co.
F. R. PALMER,	Mansfield, Richland Co.
LEO WELTZ,	Wilmington, Clinton Co.
N. H. ALBAUGH,	Tadmor, Montgomery Co.

STANDING COMMITTEE ON NOMENCLATURE.

LEO WELTZ,	Wilmington, Clinton Co.
J. R. HURST,	Chillicothe, Ross Co.
H. G. TYRON,	Willoughby, Lake Co.
GEORGE W. CAMPBELL,	Delaware, Delaware Co.
N. OHMER,	Dayton, Montgomery Co.
DANIEL DUER,	Millersburgh, Holmes Co.

This report is published as an Appendix to the report of the Ohio State Board of Agriculture (24,000 copies), and a separate addition for the members of the Society. To secure the benefits of this wide distribution of the report, and save expense to the Society, the printing has been delayed to a later date than would otherwise be done—the time of the Agricultural Report.—SECRETARY.

(For list of members, see last two pages.)

CONSTITUTION

OF THE

OHIO STATE HORTICULTURAL SOCIETY.

1st. This Society shall be known as the Ohio State Horticultural Society.

2d. Its object shall be to collect and disseminate information relative to fruits and other horticultural products, and to promote the taste for horticulture and rural embellishments among the people.

3d. Its officers shall be a President, Vice President, Secretary, and Treasurer. They shall be elected annually, by ballot, and hold their office until their successors are elected.

4th. The President shall preside and conduct all meetings of the Society, and in his absence the Vice President shall perform the same duties.

5th. The Secretary shall record all doings of the Society, perform all correspondence, and, with the assistance of the President, collate and prepare the annual report and other matters for the public press.

6th. The Treasurer shall collect and hold all funds of the Society, and pay out the same only on an order of the Secretary, countersigned by the President.

7th. The membership fee shall be one dollar per year, and any person may become a member of the Society by forwarding the fee to the Secretary or Treasurer. Each member shall be entitled to a copy of the annual report, when printed, and any other documents that may be printed for the use of the Society.

8th. There shall be an *Ad Interim* Committee, consisting of the officers of the Society and ten other members, residents of different sections of the State, to be elected annually, whose duty it shall be to observe and take notes of new and rare fruits, the fruit crops, and other matters of interest to the Society, during the season, in their several sections of the State, and report the same at the annual meeting of the Society. This committee shall also hold meetings at such times and places as the President and Secretary may direct, for the inspection of fruit and fruit crops, attending horticultural exhibitions, etc.; a report of the observations of the committee to be published annually with the transactions of the Society.

9th. The annual meeting of the Society shall open on the second Wednesday after the first Monday in December of each year, at such place as may be designated by a vote of the Society, notice of the time and place, together with the order of exercises to be sent in due time to each member, by the Secretary. At this meeting, the President will be expected to deliver an address, and the reports of the *Ad Interim* Committee, Secretary, and Treasurer will be read, and the usual business transacted, besides discussion on fruits and other topics.

10th. This constitution may be amended, and by-laws may be adopted for the government of the Society, by a vote of two-thirds of the members present at any regular meeting.

RESOLUTION.

The following resolution was adopted by the Society, at its annual meeting, December, 1882:

Resolved, That the dues from each member of the Ohio State Horticultural Society shall be one dollar per year, payable annually in advance. Should any member become one year in arrears for dues, he shall be notified of that fact by the Secretary, when if he does not pay to the proper officer such dues within six months after such notice, his name shall be stricken from the roll of members of the Society.

1. That the Secretary shall provide himself with two books, at the cost of the Society, in one of which he shall keep a record of all names of the members, and in which he shall charge up to each member his annual dues. The other shall be a receipt book so arranged that the receipts therein shall show the time to which each member has paid his dues.

THE OHIO STATE FAIR.

The Thirty-sixth Annual Ohio State Fair was held upon the grounds of the Franklin County Fair Association, near the City of Columbus, beginning on the 31st day of August and continuing till the 4th day of September, 1885, inclusive, under the general supervision and direction of the Ohio State Board of Agriculture.

This Fair was regarded as eminently successful, and in the exhibition of articles of interest and practical usefulness, quite equal to any of its predecessors.

All departments were well represented. In live stock, every class was represented by animals of superior excellence. The Departments of Fruits and Flowers, Farm and Horticultural Products, Domestic Manufactures, Mechanics and Fine Arts were well filled, all available space being occupied, and the exhibitions, as a whole, were creditable both to the exhibitors and to the State.

The exhibits of agricultural machinery were on a grand scale, and the display of the various new and improved implements was one of extraordinary extent and interest; probably never before equaled in the State. Nearly all the prominent manufacturers in the State, and many from other States were represented; and many private buildings were erected for the exhibition of their goods, and were filled with their products; many of the machines were in operation, showing their use and capabilities, altogether forming an exhibition of great interest and practical value to the agriculturists of the State.

Although the buildings for the exhibition of fruits and flowers were poorly adapted for an attractive or good display of these products, the collections were remarkably good, and the space well filled; and when the generally unfavorable season for fruit growing is considered, the exhibit was very creditable and both interesting and instructive.

This is probably the last Ohio State Fair that will be held upon the Franklin county grounds, as it is expected the Fair of 1886 will be held upon the new and spacious grounds, north of the City of Columbus, which have been purchased by the State Board of Agriculture for the establishment of permanent annual State Fair exhibitions for the future.

These grounds will be laid out and improved; new and permanent buildings will be erected for the accommodation of the various departments; and it is believed the new Fair Grounds will be a source of great interest and practical usefulness, as well as of pride and pleasure to every citizen of the State.

Gen. S. H. Hurst, of Chillicothe, had charge of the Department of Horticulture, assisted by the Ohio State Horticultural Society, and the arrangement and display of the exhibits, under their direction, was the best that could be made.

The following is a list of the awards upon fruits and flowers, in which many of the members of the Ohio State Horticultural Society were successful competitors:

COUNTY FRUITS.

Daniel Duer, of Millersburg, Holmes county, was awarded diploma and \$40.00, for the best collection of one hundred plates of fruits of various kinds, from any county in Ohio.

West & Dresbach, of Chillicothe, Ross county, second premium of \$20.00 for second best collection.

APPLES.

The display of Apples was good and attractive, but principally from the middle and southern portions of the State. The Apple crop was below the average, and in many portions of the State nearly or quite a failure.

Hurst & Hurst, of Chillicothe, Ross county, were awarded \$10.00 for best ten varieties of Winter Apples; \$5.00 for best half-bushel basket of ten varieties; \$3.00 for second-best five plates of large Winter Apples; \$1.00 for second-best approved new variety, Winter; \$5.00 for second-best display of fifteen varieties, Summer and Fall Apples; \$3.00 for second-best half-bushel basket, six varieties; \$2.00 for second-best three varieties Summer and Fall Apples for market; \$2.00 for best approved new variety; and sixteen premiums of \$2.00 each, for best plates of five specimens, of American Summer Pearmain, Ben Davis, Ortley, Hawley, Fall Wine, Jonathan, King of Tompkins Co., Roxbury Russet, White Pippin, Stark, Wagener, Maiden's Blush, Early Harvest, Am. Golden Russet, Limber-twig, and Newtown Pippin.

To Daniel Duer, of Millersburg, Holmes county, \$10.00 for best display fifteen varieties, Summer and Fall Apples; \$3.00 for second-best six varieties; \$2.00 for second-best three varieties; \$2.00 for second-best three varieties, large; \$3.00 for best three varieties for market; \$8.00 for second-best display of thirty varieties Winter Apples; \$3.00 for second-best half-bushel basket, ten varieties; \$1.00 for second-best variety, dessert; \$3.00 for second-best five varieties, Winter; and thirteen premiums, \$2.00 each, for best plates of five specimens, Baldwin, Belmont, Clermont, Gravenstein, Grimes' Golden, Hubbardston, Red Canada, Benoni, Roman Stem, Willow-twig, Lady Apple, Powell, and Summer Queen; two premiums of \$2.00 each for best plates Crab-Apples, Transcendent, and Hughes' Virginia.

To William H. West, of Chillicothe, Ross county, \$5.00 for best six varieties Summer and Fall Apples; \$3.00 for best three varieties, large; \$1.00 for second-best variety summer dessert; \$5.00 for best half-bushel basket six varieties; and four premiums of \$2.00 each for best plates of five specimens, Paradise Winter Sweet, Smoke-house, Milam, and Rawles' Janet.

To Nelson Dresbach, of Hallsville, Ross county, \$15.00 for best display of thirty varieties Winter Apples, quality and beauty to rule; \$3.00 for second-best six varieties for market; \$3.00 for best three varieties, Summer and Fall; and seven premiums of \$2.00 each for best plates of five specimens, Fall Pippin, Fallwater, Northern Spy, Peck's Pleasant, Rhode Island Greening, Pennsylvania Red-streak and Seek-no-further.

To Nelson Cox, of Bradrick, Lawrence county, \$5.00 for second-best ten varieties Winter Apples; \$5.00 for best five plates of large; \$5.00 for best six varieties for market, and three premiums of \$2.00 each, for best plates Rome Beauty, Smith's Cider, and Black Gilliflower.

To Isaac Freeman, of Rex, Miami county, \$2.00 for best variety of Winter dessert; and \$2.00 for best Fall dessert Apples.

To W. Oliver, of Kingston, Ross county, \$5.00 for best five varieties, Winter; and \$2.00 for best plate Belleflower.

To Miss Lizzie Hurst, of Chillicothe, Ross county, \$2.00 for best variety Summer dessert; and \$1.00 for second-best variety Fall dessert Apples.

To S. H. Hurst, of Chillicothe, Ross county, four premiums, of \$2.00 each, for best plates Rambo, Newton Spitzenberg, Winesap, and Fameuse.

To A. Webster, of Clintonville, Franklin county, \$1.00 for second-best approved new variety of Summer or Fall Apples.

To W. H. Hendron, of Groveport, Franklin county, \$3.00 for best approved new variety Winter Apple.

To S. J. Wooley, of Hilliards, Franklin county, \$2.00 each, for best plates Ohio Nonpareil and English Russet.

To J. St. John, of Lebanon, Warren county, \$2.00 for best plate Porter.

To David Jones, of Hallsville, Ross county, \$2.00 for best plate Western Beauty.

To J. M. Miller, of Columbus, Franklin county, \$2.00 for best plate Twenty-ounce.

To H. Bookwalter, Hallsville, Ross county, \$2.00 for best plate Chenango Strawberry.

To A. Oliver, of Kingston, Ross county, \$2.00 for best plate Fink.

To Mrs. S. J. Wooley, of Hilliards, Franklin county, \$2.00 for best plate Yellow Siberian Crab.

PEARS.

Pears were quite plenty, and the display large and interesting; but specimens were hardly as fine as at some former exhibitions. The following premiums were awarded:

To Isaac Freeman, of Rex, Miami county, \$10.00 for best twelve varieties Summer, Fall, and Winter; \$3.00 for best six varieties Summer and Fall; \$5.00 for second-best display of twenty varieties; \$2.00 for best plate Onondaga; and \$2.00 for best plate Belle Lucrative.

To C. A. Powers, of Perrysburgh, Wood county, \$15.00 for best display of twenty varieties; \$5.00 for second-best six varieties Summer and Fall; \$3.00 for second-best six varieties for market; \$2.00 for best plate Beurre Diel; and \$2.00 for best plate Columbia.

To Nelson Cox, of Bradrick, Lawrence county, \$2.00 for second-best three plates large; \$3.00 for best half-peck Seckel; \$3.00 for best half-peck Bartlett; \$2.00 for best plate Beurre Clairgeau; and \$2.00 for best plate Seckel.

To N. Ohmer, of Dayton, Montgomery county, \$6.00 for best six varieties for market; and \$5.00 for second-best twelve varieties Summer, Fall, and Winter.

To John Poste, of Columbus, Franklin county, four premiums, \$2.00 each, for best plates of Bartlett, Howell, Lawrence, and Louise Bonne de Jersey.

To J. P. Streeper, of Chillicothe, Ross county, \$3.00 for best new variety; and \$2.00 for best plate Buffum.

To Daniel Duer, of Millersburg, Holmes county, \$2.00 for best plate Clapp's Favorite; and \$2.00 for best plate Kieffer.

To Jacob Linxweiler, of Dayton, Montgomery county, \$3.00 for best three plates large Pears.

To Hurst & Hurst, of Chillicothe, Ross county, \$2.00 for best variety of dessert Pear.

To S. Irons, of Lebanon, Warren county, three premiums, of \$2.00 each, for best plates Beurre Bosc, Beurre d'Anjou, and Duchesse d'Angouleme.

To B. E. Poste, of Columbus, Franklin county, \$2.00 for second-best half-peck Seckel.

To Gottlieb Long, of Chillicothe, Ross county, \$2.00 for best plate Doyenne Boussock.

To Frederick Brant, of Chillicothe, Ross county, \$2.00 for best plate Flemish Beauty.

To A. Stubbs, of Lebanon, Warren county, \$2.00 for best plate Vicar of Winkfield.

PEACHES.

The display of Peaches was very limited, and from the southern part of the State only. The awards were as follows:

To Hurst & Hurst, of Chillicothe, Ross county, \$1.00 for second-best three varieties; and four premiums, \$2.00 each, for best plates Ward's Late, La Grange, Smock, and Pride of Essex.

To G. E. Davis, of Preston, Maryland, \$5.00 for best six varieties; and \$3.00 for best three varieties.

To Nelson Cox, of Bradrick, Lawrence county, \$2.00 for best plate of one variety; \$2.00 for best new seedling, approved by committee; and \$2.00 for best Cling.

To M. Lawrence, of Columbus, Franklin county, \$1.00 for second-best new seedling; and \$2.00 for best plate Red-cheeked Melocoton.

To William H. West, of Chillicothe, Ross county, \$2.00 for best plate Heath Cling; and \$2.00 for best plate Stump-the-World.

PLUMS.

To S. H. Hurst, of Chillicothe, Ross county, \$5.00 for best display of ten varieties; \$3.00 for best five varieties; \$2.00 for best three varieties; and four premiums, \$2.00 each, for best plates Lombard, Imperial Gage, Pond's Seedling, and Long Scarlet.

To Hurst & Hurst, of Chillicothe, Ross county, \$3.00 for second-best display of ten varieties; \$2.00 for second-best display of five varieties; and \$1.00 for second-best display of three varieties.

To Wm. H. West, \$2.00 for best plate Shropshire Damson; and \$2.00 for best plate any other variety.

GRAPES—HARDY.

The display of Grapes was remarkably good, considering the early period at which the Fair was held, and that no exhibits were made from the Islands and Lake-shore region. Some of the exhibits from the southern portion of the State were very fine. Awards as follows:

To Geo. W. Campbell, of Delaware, Delaware county, \$15.00 for best twenty varieties, four bunches each; and five premiums, \$2.00 each, for best plates Brighton, Moore's Early, Early Victor, Vergennes, and Duchess.

To Wm. H. West, of Chillicothe, Ross county, \$10.00 for best ten varieties; \$6.00 for best six varieties; \$3.00 for best three varieties; \$3.00 for best three plates late grapes; \$2.00 for best plate Catawba; \$2.00 for best plate Ives; and \$2.00 for best plate Norton's Virginia.

To Jacob Linxweiler, of Dayton, Montgomery county, \$10.00 for second-best twenty varieties; \$5.00 for second-best ten varieties; \$3.00 for best three plates grapes for red wine; \$2.00 for best plate Martha; \$2.00 for best plate Salem; and \$2.00 for best plate Jefferson.

To John S. Snider, of Lancaster, Fairfield county, \$3.00 for second-best six varieties; \$2.00 for second-best three varieties; \$3.00 for best three plates grapes for white wine; \$2.00 for best plate Lady; \$2.00 for best plate Wilder; \$2.00 for best plate Elvira; and \$2.00 for best plate Missouri Riesling.

To Joseph Kratochwill, of Dayton, Montgomery county, \$2.00 for best plate Pocklington; and \$2.00 for best plate Lady Washington.

To Van Burton, of Lancaster, Fairfield county, \$2.00 for best plate Concord.

To John Piffner, of Delaware, Delaware county, \$3.00 for best plate early table grapes.

To August Pott, Dayton, Montgomery county, \$2.00 for best plate Delaware.

To Michael Witt, Columbus, \$3.00 for best new and valuable seedling.

FLOWERS AND PLANTS—PROFESSIONAL LIST.

There were not many exhibitors in this department, but there were some very attractive collections, and many handsome and well grown specimen plants. The exhibit, as a whole, was quite creditable. The awards were as follows:

To Maurice Evans, of Columbus, Franklin county, \$20.00 for best collection of plants and finest arrangement; \$5.00 for best single specimen plant; \$15.00 for best collection of Palms; \$5.00 for best single specimen; \$15.00 for best collection of Ferns; \$5.00 for best single specimen; \$15.00 for best collection Variegated Plants; \$8.00 for best collection of Begonias; \$2.00 for best single specimen; \$2.00 for best single specimen Ornamental Grass; \$8.00 for second-best collection of Evergreens; \$5.00 for best collection of Plants on trellis-work; \$2.00 for best single specimen; \$5.00 for best collection of Cactus; \$3.00 for best single specimen; \$10.00 for best collection of Roses; \$3.00 for best single specimen; \$5.00 for best collection of Verbenas; \$5.00 for best Ribbon-Bed of living plants; \$5.00 for best pair of Vases, living plants; \$5.00 for best six Hanging Baskets of living plants; \$5.00 for best pair Hand Bouquets; \$5.00 for best pair Parlor Bouquets (15 inches); \$20.00 for best display of Floral Designs; \$5.00 for best display of cut Verbenas; and \$15.00 for best display of cut Flowers.

To J. F. Sked, of Westerville, \$10.00 for second-best collection of plants, and arrangement; \$10.00 for second-best collection Variegated Plants; \$3.00 for best single specimen; \$5.00 for best collection of Cannas; \$5.00 for best collection of Ornamental Grasses; \$15.00 for best collection of Evergreens; \$5.00 for best single specimen; \$5.00 for second-best collection of Begonias; \$3.00 for best collection of Aloes; \$1.00 for best single specimen; \$8.00 for best collection of Fancy Caladiums; \$2.00 for best single specimen; \$10.00 for best collection of New Plants; \$5.00 for best Arch of living Plants; \$3.00 for second-best Ribbon-Bed of living plants; \$5.00 for best piece of Rustic Work; \$5.00 for best display of cut Dahlias; \$5.00 for best display of cut Gladiolus; \$5.00 for best display of cut Phloxes, and \$8.00 for second-best display of Cut Flowers.

To Mrs. C. A. Huber, of Circleville, Pickaway county, \$3.00 for second-best pair Hand Bouquets; \$3.00 for second-best pair Parlor Bouquets (15 inches); and \$15.00 for second-best display of Floral Designs.

To Wm. Halley, of Columbus, Franklin county, \$10.00 for best Aquarium.

PLANTS AND FLOWERS—AMATEUR LIST.

To Mrs. N. E. Lovejoy, of Columbus, Franklin county, \$8.00 for best collection 12 varieties; \$2.00 for best specimen Cactus; \$5.00 for best collection of Roses in bloom; \$3.00 for best collection of cut Roses; \$2.00 for best display of Geraniums.

To Mrs. W. R. Sprague, of Brice, Franklin county, \$5.00 for best specimen Plant, in or out of bloom; \$2.00 for best specimen Geranium; \$5.00 for best collection of Plants on Trellises; and \$3.00 for best single Rustic Basket.

To Miss Bell McClelland, of Columbus, Franklin county, \$5.00 for best collection of Coleus, 10 varieties; \$3.00 for best six specimens of Coleus.

To Miss Addie Pugh, of Columbus, Franklin county, \$3.00 for best collection of Aloes and Cactus, in pots; \$5.00 for best collection of Ferns and Lycopodiums; and \$5.00 for best six Hanging Baskets of living plants.

To Miss Anna Loffland, of Columbus, Franklin county, \$2.00 for best display of cut Balsams; and \$3.00 for second-best display of Cut Flowers.

To Mrs. J. Zirkle, of Columbus, Franklin county, \$3.00 for best display of cut Verbenas; \$5.00 for best display of Cut Flowers; and \$3.00 for best collection of Native Flowers.

To Miss Jennie Cerder, of Marysville, Union county, \$8.00 for best Table Designs of cut flowers; \$2.00 for best display of cut Asters; and \$2.00 for second-best display of Parlor Bouquets.

To Mrs. H. Bieber, of Delaware, Delaware county, \$2.00 for best display of cut Pansies; \$2.00 for best display of Coxcombs and Amaranths; and \$2.00 for best display of Double Zinnias.

To C. M. Morrison, of Taylor, Franklin county, \$2.00 for best specimen Aloes.

To Mrs. J. W. Baker, of Columbus, Franklin county, \$3.00 for best specimen Begonias.

To Mrs. W. F. Barr, of Brice, Franklin county, \$3.00 for second-best six Hanging Baskets of living plants.

To Miss Emma Aldons, of Columbus, Franklin county, \$5.00 for second-best Table Designs of cut flowers.

To Stephen Cook, of Blendon, Franklin county, \$5.00 for best collection of cut Dahlias; and \$2.00 for best collection of cut Phloxes.

To Mrs. A. L. Perry, of Lewis Center, Delaware county, \$3.00 for second-best collection of cut Dahlias.

To Mrs. M. F. Williams, of Columbus, Franklin county, \$2.00 for second-best collection of Native Flowers.

THE STATE FAIR MEETING.

The meeting of the Ohio State Horticultural Society for the special examination and report upon such fruits as are presented from the exhibits at the State Fair, and for the selection of a place for holding the regular Annual Meeting of the Society, was held at the Board of Trade Room, City Hall, in the city of Columbus, on the evening of Thursday, September 3d, 1885.

The meeting was called to order at 8 o'clock P. M., by President Ohmer.

Mr. G. S. Innis moved that the first business of the evening should be the selection of the place for holding the next regular annual meeting of the State Horticultural Society; which was seconded and carried.

Mr. J. M. Westwater, President of the Columbus Horticultural Society, said he was instructed by the members of his Society to give the State Horticultural Society a cordial invitation to hold their annual meeting again in Columbus, assuring them that every thing should be done to render the meeting pleasant and profitable. He believed both Societies would be benefited by having the meeting in Columbus, and he urged the claims of Columbus, and the Columbus Horticultural Society with many pleasant words and cogent reasons for holding the meeting at the most central and accessible point, the Capitol of the State.

Mr. Babcox, of Plymouth, said he had been requested to extend an invitation for the Society to hold the meeting at Cleveland.

Mr. W. W. Farnsworth, of Waterville, presented an invitation from the Lucas County Horticultural Society, to have the meeting in South Toledo.

Mr. H. G. Tryon, of Willoughby, Lake county, named Painesville as a suitable place for the meeting, stating that many years had passed since a meeting of the State Society had been held in that section. He had extended an invitation to the Society to have the meeting at Painesville last year, and he renewed it, hoping now to be more successful, assuring the members of a pleasant reception and cordial welcome, if the meeting was held at that place.

Mr. N. H. Albaugh, of Tadmor, Montgomery county, on behalf of the Miami Valley and the Montgomery County Horticultural Society, invited the Society to meet at Dayton. They would be always welcomed, and the latch-string would be always on the outside whenever the State Society would hold its meeting with them.

Mr. H. Wilson said he would second the request of Mr. Farnsworth to have the meeting at South Toledo, and gave reasons why he thought it might be advisable to have the meeting in the northwest portion of the State.

Mr. Babcox said he would withdraw his invitation for Cleveland in favor of Painesville; and as it was many years since there had been a meeting of the Society in that part of the State, he was in favor of holding the meeting at Painesville.

Mr. L. B. Pierce, of Tallmadge, said there was a probability that the American Horticultural Society would hold a meeting at Cleveland in January next, and he thought it would hardly be advisable to have two meetings of this character there, so nearly at the same time.

Gen. S. H. Hurst, of Chillicothe, spoke warmly in favor of holding the meeting again at Columbus. The principal, and most important business of

the Society was transacted at its annual meeting, and it should be held at the most central, and the most accessible point for the greatest number of its members, and where they could most conveniently attend. Columbus was a great railroad center, and he believed a larger and better attendance would be secured at Columbus than at any other point, and while summer, and other meetings could be properly held at other points, he was decidedly in favor of holding the annual meeting at Columbus.

Upon motion of Mr. Babcox, the Society then proceeded to vote upon the several propositions, and it was found that Columbus had received the largest vote in favor of holding the next annual meeting at that place.

Secretary Campbell then moved that the vote of the Society be made unanimous in favor of Columbus, which was carried without a dissenting voice.

Mr. L. B. Pierce moved that a collection of pears, apples, and grapes be sent to the meeting of the American Pomological Society at Grand Rapids, which is to be held from the 9th to the 11th of the present month.

Gen. S. H. Hurst approved the motion of Mr. Pierce, and thought the collection should include a full collection of apples and other fruits which shall fairly represent the fruit-growing interests of the State of Ohio.

On motion of Col. G. S. Innis, a committee was appointed to select from the fruits at the State Fair a suitable collection for exhibition at Grand Rapids, Mich., at the expense of the State Horticultural Society.

Mr. Jacob Linxweiler, of Dayton, was appointed to make a collection of grapes. Mr. Daniel Duer, of Millersburgh, assisted by Mr. A. G. Babcox, of Plymouth, to select the apples; and Messrs. John Poste, of Columbus, and W. W. Farnsworth, of Waterville, to select the pears for exhibition at Grand Rapids, as above stated.

Prof. W. R. Lazenby moved that a delegation of three members of the Ohio State Horticultural Society be appointed to attend the meeting of the American Pomological Society at Grand Rapids next week, and named President N. Ohmer and W. J. Green as two of said delegation. Mr. Daniel Duer named A. G. Babcox, of Plymouth, as the third member, and these three gentlemen were duly appointed by vote of the Society.

Col. G. S. Innis stated that the vicinity of Lancaster, Ohio, was quite remarkable for the production of fruits, often having fine crops of grapes when other sections failed, and that this section had been exceptionally free from attacks of the grape-rot which had been so destructive in many localities. He moved that a committee of three members of the Society be appointed, with instructions to visit Lancaster and its vicinity, and to take observations upon the fruits growing in that neighborhood, especially in the vineyards, and to report the result of their observations at the next annual meeting.

The motion of Col. Innis prevailed, and Messrs. F. R. Palmer, of Mansfield, E. H. Cushman, of Euclid, and G. R. Miller, of Norwich, were duly appointed as said committee.

Mr. John Poste, of Columbus, exhibited some pears resembling the Howell in appearance, but which grew upon a Vicar of Winkfield tree which had been grafted upon the Howell stock. He said it was undoubtedly, either the effect of the stock upon the graft, or of cross-fertilization in the blossom. The pears exhibited, ripened earlier than the Vicars of normal appearance and character, on the same tree.

Mr. Geo. W. Trowbridge, of Glendale, exhibited some small clusters of white grapes which were the first bearing of a young vine grown from seed of the Niagara grape. Several members who tasted these grapes, thought they were better flavored than the parent Niagara.

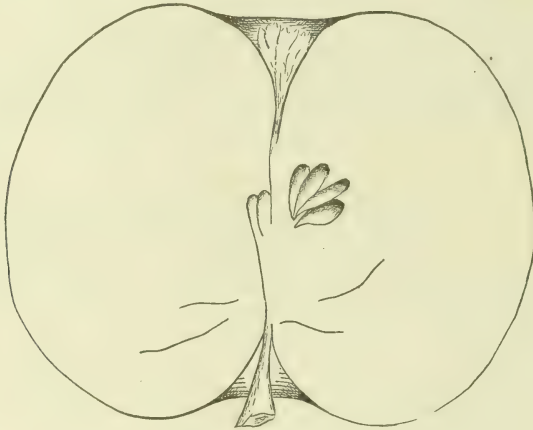
Mr. M. Witt, of Columbus, exhibited some handsome specimens of a new

white grape, evidently a Concord seedling, which was favorably regarded, and which was awarded the premium, at the State Fair, for the best new seedling, not before exhibited. It is a grape of handsome appearance, good flavor, full medium size, and, as the growth and foliage are of the Concord type, may fairly be regarded as promising, and worthy of trial.

Mr. E. H. Cushman exhibited a black grape grown by Mr. R. A. Hunt, of Euclid. This grape was about the size of the Clinton, but did not appear to be ripe. It was thought to be promising as a wine grape, but further observation will be necessary to determine its character and value.

Handsome specimens of the Pocklington grape were exhibited, showing large size and fine appearance, but were not ripe enough to judge of their quality.

Mr. J. R. Hurst exhibited an unnamed apple, which he thought worthy of notice, as a remarkably long keeper, having been kept over in good condition till September of the following year after bearing. Color, when mature, yellow, with tinge of blush-red; in quality and general character resembling the Fink apple, but much larger in size. The following is an outline of the specimen exhibited:—



CHILLICOTHE.

Mr. Albaugh proposed that the apple be named Chillicothe. The Secretary is not certain that action was taken upon this by the Society, but is under the impression it was assented to.

NINETEENTH ANNUAL MEETING

OF THE

OHIO STATE HORTICULTURAL SOCIETY.

The Nineteenth Annual Meeting of the Ohio State Horticultural Society was held in the Board of Trade Rooms, City Hall building, Columbus, Ohio, on Wednesday, Thursday, and Friday, December 2d, 3d, and 4th, 1885, by invitation of the Columbus Horticultural Society.

WEDNESDAY FORENOON, December 2, 1885.

The forenoon of Wednesday was principally occupied by the members present in arranging a very handsome and interesting display of fruits upon the tables in the upper hall. The principal exhibitors were Nelson Cox, of Bradrick, Lawrence County; Daniel Duer, of Millersburg, Holmes County; J. H. Hurst and S. H. Hurst, of Chillicothe, Ross County; N. W. Julian, of Chillicothe, Ross County; Joseph B. Mitchell, of Grove City, Franklin County; F. R. Palmer, of Mansfield, Richland County; Joshua Seney and W. H. West, of Chillicothe, Ross County, all of whom had very creditable exhibits of apples, a report of which will be found in following pages, by the Fruit Committee. E. H. Cushman, of Euclid, Cuyahoga County, and Jacob Linxweiler, Sr., of Dayton, Montgomery County, exhibited collections of grapes, and F. R. Palmer, of Mansfield, Richland County, and E. H. Olting, of Wadsworth, Medina County, exhibited good collections of potatoes.

The display altogether was both instructive and attractive, and came, as noted above, from those portions of the State which were favored in having a crop of apples; in many sections they had failed for two years in succession.

WEDNESDAY AFTERNOON, December 2, 2 P.M.

The meeting was called to order by President N. Ohmer promptly at 2 o'clock, and, after a few words of greeting to the members present, called upon the Rev. Mr. Grover, who invoked the Divine blessing upon the meeting, its work, and its objects.

The President then appointed the following gentlemen as a Committee on Business: Wm. R. Lazenby, of Columbus; W. W. Farnsworth, of Waterville, and G. S. Innis, of Columbus.

Reports from the *ad interim* Committee were then called for, and were responded to as follows:

AD-INTERIM REPORT FOR SUMMIT COUNTY AND VICINITY.

BY MATTHEW CRAWFORD, OF CUYAHOGA FALLS.

Mr. President and Gentlemen:

The season has been somewhat peculiar. The winter was unusually severe, and the summer cool and moist. The reports received at the spring meetings of our Horticultural Society were very discouraging to fruit-growers; but as the season advanced our prospects brightened, and the majority of fruits have produced full, average crops.

STRAWBERRIES

were unusually abundant. Even old, neglected beds yielded a large amount of salable fruit. Prices were very low, which was fortunate for thousands of poor people in cities who had but little money. Growers found it necessary to exercise great care in getting their berries to market in good order. In one instance within my acquaintance the grower gave away about one-fourth of his crop, selling none but the best. These brought him more than he would have received for all, had they been mixed together, besides maintaining his reputation for marketing none but first-class berries. People have become accustomed to getting good fruit, and nearly all who are able are willing to pay an extra price for it rather than to buy a poor article cheap. For this reason the Crescent is not a favorite with careful growers, although it occupies an important place in furnishing a cheap supply for those who might otherwise go without. It was repeatedly offered in our market for \$1.40 per bushel, while finer varieties sold for nearly twice as much.

The Cumberland has long been a great favorite.

The Manchester and Daniel Boone have given good satisfaction, although the former is inclined to rust, sometimes.

The Sharpless was very fine this year, as we had no spring frost to injure its blossoms.

The Kentucky was once the leading late berry, but was superseded by the Glendale, which, in turn, has given place to the Mt. Vernon. This, on account of its vigorous growth, productiveness, large size, fine quality and its adaptation to nearly all soils and localities will be likely to hold its own for some time.

The Capt. Jack and Windsor Chief may always be relied upon to yield a good crop of medium sized berries, of rather poor quality.

The Sucker State has given satisfaction, being a good grower and bearer, of large size, fine form and color, and of good quality.

Longfellow is remarkably fine when well grown, and is a favorite with those who grow for pleasure rather than profit.

I had the pleasure of meeting with the Portage County Horticultural Society twice during the summer. At its June meeting there was one of the greatest exhibitions of strawberries I ever attended. Nearly every desirable variety, both old and new, was there in great perfection. Our own strawberry meeting was held a few days before, and we had some very fine berries on exhibition, but not nearly as many varieties.

RASPBERRIES

were abundant, and brought from three to four dollars a bushel.

The Tyler and Souhegan are good and reliable early varieties. They are among the most hardy and prolific, and may be planted with safety. They are much alike, but not the same.

The Ohio or Chapman, is hardy, vigorous and productive; not as large as those already named, but of fair size. Season medium.

The Gregg is the most popular, late, black cap. Its vigorous growth, productiveness, large size and lateness make it desirable. It is not as hardy as the others, and its mouldy appearance detracts somewhat from its value in market. We want a variety with the desirable qualities of the Gregg, with greater hardiness. The Nemaha and Ada may meet our wants.

The Hilborn is a Canadian variety, which has fruited two years with me. It is very large, jet black, and of better quality than any other I have seen. For vigor, hardiness, and productiveness, it is equal to any. Season, medium.

Beebe's Golden is unsalable on account of its color, although possessing all the other good qualities of a black cap.

Among the red varieties, the Superb was uninjured by the winter, while the Cuthbert and Reeder were nearly ruined. It is only moderately firm; otherwise it is ahead of any other I have tried in every important respect.

The Herstine, in sheltered situations, is admirable, but it is too tender to be relied upon.

The Hansell is hardier than the Cuthbert, but it was somewhat injured. It is a little earlier than the Superb, but not as desirable.

The Caroline is quite hardy, and of excellent quality, but inclined to crumble. Its color renders it unsalable.

The Erie, an old but little known variety, has fruited with me two years. It yields a larger crop in the fall, than any other variety I have seen. Of course it bears on the present year's growth. I consider it desirable for home use.

The Shaffer is very valuable, although its color is not the most attractive. No variety is better for canning, and it combines vigorous growth, hardiness, productiveness and size in a far greater degree than any other I have seen.

CURRENTS

yielded a full crop where the worms were kept off. Owing to neglect, many bushes have been killed altogether, and the price of this fruit has advanced so that its culture is now profitable. Red varieties are the most salable, and the Victoria is the best one that is well tried. It is an abundant bearer, with long stems, and will remain on the bushes in good condition longer than any other.

The White Grape is the favorite white variety, but white currants, like yellow raspberries, are not salable. I have fruited the Fay one season, and am favorably impressed with it. The Cherry and Versailles are both too unproductive to be profitable.

BLACK CURRANTS

are not extensively grown. The Black Naples is the principal variety, but the Lee's Prolific is likely to take its place, having less of that rank flavor that is so distasteful to most Americans. It approaches the huckleberry in mildness, and is large and prolific. People who dislike black currants can learn to eat Lee's Prolific. This fruit may be grown with profit where there is a demand for it, as it has few or no insect enemies.

GOOSEBERRIES

were a full crop, but this fruit is not grown to any great extent, the currant worm being even more destructive to it than to the currant. The Downing is the principal variety.

During the summer, I received specimens of a new native seedling from A. H. House, of Portage County. It is larger than the Downing, of the same color, and wonderfully productive. It was also shown at the Portage County Society's meeting. It may prove valuable.

BLACKBERRIES

were very scarce in northern Ohio this season, all but the very hardiest having been killed in the winter. In a field planted in the spring of 1884, the E. Harvest, Wilson, Jr., E. Cluster, and Taylor were killed to the ground. The Snyder had about six or eight inches of live wood in the spring, but it bore only a few scattering berries.

Stone's Hardy was almost uninjured, and bore nearly a full crop.

Agawam was alive to the ends of the branches, and bore abundantly.

The fruit of the Stone's Hardy is about the size of the Snyder, while the Agawam is larger and of the best quality of any variety I have seen.

On another lot, with the same exposure, the Early Cluster bore a few berries.

I had two plants of the Uncle Tom that seemed to be all right in the spring, but one of them bore none, while the other produced a small crop of large berries. It may be that these were protected somewhat by snow drifts.

The Lucretia Dewberry, near by, bore a full crop of very large and good berries. The quality was better than that of any other except the Agawam. The vines of this variety run on the ground, and were probably under the snow nearly all winter.

THE GRAPE

is not extensively grown in Summit County, but nearly every place has a few vines for home use. The Concord is the principal sort, and it produced abundantly this season. Very little rot appeared. The Catawba is rarely met with, but the Delaware is quite common, and succeeds well. The Worden is occasionally seen. It is much like the Concord, but a week earlier, and better in every respect. Some of Rogers' Hybrids, especially the Salem, Agawam, Wilder, and Merrimack are grown, and succeed reasonably well. The Lady has made a good record for hardiness and fine quality.

Grapes have rotted so badly for some years that many growers have become discouraged and grubbed out their vineyards. We have been expecting much from Dr. Jewett's carbolic acid remedy, but our faith is shaken in it somewhat. F. C. Miller, of New Philadelphia, now comes with a preventive that is at least worthy of a fair trial. In a vineyard where grapes formerly rotted, this has been used three years, and during that time not one rotten berry has appeared, although grapes have

rotted in the neighborhood as before. Early in the summer, copperas is sown in the vineyard, at the rate of a quart to the square rod.

Peaches, plums, and sweet cherries were almost a total failure, having been winter killed.

PEARS

were abundant and cheap. Old trees that bear every year, with scarcely ever a sign of blight, may be found in all parts of the county. As a rule, these trees receive little or no care, but grow in the turf, or near buildings, where their roots are rarely disturbed.

APPLES

were a fair average crop, and of fine appearance. Farmers generally get but little profit from their orchards, for the reason that they have so few trees of any one desirable variety. Some are grubbing out their trees. It would seem that the time has come for the culture of the apple to receive more attention, for the following reasons:

Much of the hill land of Ohio is better adapted to this fruit than to common farm crops.

The farmers of the west can send most farm products here, at less cost than they can be produced in Ohio.

There is a market in Europe for all the good apples we are likely to send:

And evaporators have made it possible for farmers to utilize all their fruit.

THE POTATO

is an important crop with us, and this season was peculiarly favorable, had it not been for one circumstance—they were struck with the blight quite early, and rot soon after attacked the tubers. Those who had early varieties, planted so early that they were ripe, or nearly so, before the blight made its appearance, were fortunate. The knowing ones dug their potatoes soon after the blight came, although they were not full grown. Some waited later, and lost most of the crop.

ORNAMENTAL PLANTING

is the branch of horticulture in which our people are most deficient, and in this line our best efforts should be exerted. In riding through the country, one may see evergreens trimmed up like deciduous trees, ornamental trees in rows like an orchard, and flower-beds on each side of the path to the front door, with both sides exactly alike. Many farmers who can seed down land for meadow or pasture, can no more make a lawn than they can make a coat.

Agricultural papers have done much towards improvement in this direction: the Grange and Farmers' Institutes have helped somewhat; but Horticultural Societies can do most of all.

Secretary Campbell.—I would like to ask one or two questions about the Superb raspberry. Does it crumble badly?

Mr. Crawford.—No, sir; not in our county.

Secretary.—And the Erie raspberry; is it the one that was originated by Mr. Carpenter, of Kelley's Island?

Mr. Crawford.—Yes, sir; it is the same.

Secretary.—It is true, the Black Currant has an unpleasant flavor, but it is not a berry that is to be eaten without cooking, and it may not be generally known that cooking destroys this flavor. The Black Currant, when used in making jam, jelly, and the like, where it is cooked, makes a very pleasant substitute for cranberry. The Lee's Prolific I have not tested. I am glad to hear so good an account of it. I have no doubt it is worthy of cultivation.

Prof. Lazenby.—It is well known to many of the members here that the annual session of the Indiana State Horticultural Society is now assembled at Lafayette. I think that, as an expression of fraternal feeling, it would be very appropriate to send them a word of greeting by telegram this afternoon.

I therefore move that a committee of one be appointed to express this kindly feeling toward the meeting of our sister State.

President Ohmer.—I would suggest that we send one also to Michigan, and to Kansas, and probably some others, for several States are holding their meetings at this time.

The President appointed Prof. Lazenby to send messages of greeting to the State Horticultural Societies of Michigan, Indiana, and Kansas.

AD INTERIM REPORT FOR LUCAS COUNTY.

BY W. W. FARNSWORTH, OF WATERVILLE.

The horticulturists of Northwestern Ohio have fared comparatively well this season, especially the growers of small fruits.

Beginning with strawberries—the crop was generally excellent, though some varieties rusted badly.

The Crescent, as usual, was the first to give paying pickings.

Iron-Clad ripened its fruit very rapidly at about the second, third, and fourth pickings, but is not large enough, nor productive enough to be of any great value.

Manchester rusted badly.

Sharpless did better than usual, as there were no spring frosts to injure it. It is not productive enough to be profitable on my soil, however.

Of the newer varieties which I tested, Daniel Boone and Bright Ida were the most promising, although the Daniel Boone was somewhat imperfect this season.

Cornelia did not have an opportunity to display its merits or demerits, as I had so much confidence in the statements of its introducer and others, that I dug up nearly all my plants for resetting.

The Mrs. Garfield bore a handsome berry, but too small, and the foliage was poor.

Jumbo may be different from Cumberland Triumph, but if it is, I failed to discover it. Both are fine berries, but hardly productive enough, ordinarily, for profit.

The yield of strawberries was so great that prices were quite low. My own averaged a little over two dollars per bushel, but my commission merchant informed me that this was the highest average obtained by any of his shippers.

The Crescent is stealing a march on the Wilson in the markets. The latter seemed to be unusually dark this season, and, after standing a few hours, its dark, dull color contrasted very unfavorably with the brighter, fresher color of the Crescent. The Cincinnati stand is the favorite package in our market. Grocers prefer to buy berries in it, as they then have a chance to do their own measuring when retailing. It is also a very convenient package to pack berries in.

Raspberries were a good crop. Hansell and Turner began ripening June 1st, Welch and Crimson Beauty, July 1st.

The Hansell surprised me by its unusual behavior this year in holding out good picking as long as any other red variety, with the single exception of the Cuthbert.

Marlboro pleased me very much with its thrifty, stocky growth, but I was somewhat disappointed in its flavor.

Turner has done well this season, especially on sand.

Superb is a fine berry, but I do not find it profitable.

Reliance lacks productiveness, as grown on my grounds, and crumbles badly. Different portions of the same berry ripened unevenly, thus giving the fruit a mottled and unattractive appearance.

I am much pleased with Shaeffer for home market and canning. I grew specimens this year, measuring over three inches in circumference.

The price was very satisfactory, averaging over four dollars per bushel, wholesale.

Blackberries might be said to be a failure, as there are few of the hardier varieties in this section which are old enough to bear a full crop.

Snyder and Taylor bore a good crop, and are certainly very valuable.

Currants were a light crop; Red Dutch and Victoria doing about as well as any.

Grapes in my immediate vicinity were a good crop. In the next county, on clay soil, they rotted badly.

Pears were a good crop, but brought much better prices in our markets than in other portions of the State. Good Bartlett's brought about \$1.50 to \$2.00 per bushel. Choice Duchess sold at \$5.00 per barrel. Very little blight.

Apples were a very poor crop, both in quantity and quality.

The Baldwin seemed to do about as well as any. He who will inform us how to

grow Baldwin apples on hardy, healthy trees will be a benefactor to mankind in general, and the orchardists of Northern Ohio in particular.

IN VEGETABLES

potatoes were a fair crop, but some of the later ones rotted badly, especially on low, wet soils.

The White Star is taking the lead among late varieties, and the Beauty of Hebron still stands at the head of the earlier ones, all things considered.

Cabbages are grown very largely in our county, and were a good crop this year, and brought remunerative prices; generally selling at about \$2.75 per 100 by the wagon-load. Hundreds of car-loads are shipped from Toledo every fall.

I had nearly forgotten the cranberry, which is grown to some extent in our county. The crop was seriously injured this year by frost, about September 1st, which destroyed more than half the crop. This fruit has proven highly profitable under proper conditions.

AD-INTERIM REPORT FOR HOLMES COUNTY.

BY DANIEL DUER, OF MILLERSBURG.

Mr. President and Members of the Ohio State Horticultural Society:

I am pleased to say the production of fruits of all kinds is constantly increasing in that part of the State I represent, and that home prices are not decreasing. Although there was a partial failure this year in nearly all classes of fruit, there has not been a falling off in the interest manifested by horticulturists for their increased production. Especially has this been the case with persons engaged in growing small fruits. During the year now drawing to a close, the acreage for the production of small fruits has been increased by the setting of new plants, and preparing the land for others next spring. The number of apple, pear, quince and other fruit trees planted last spring and fall is quite large, and of approved varieties. The selection of varieties adapted to our soil and climate is not confined to apples and pears, but includes also small fruits. I make this statement as evidence of the improvement of our farmers and fruit-growers in the science of Horticulture.

SMALL FRUITS.

With the exception of Raspberries, the crop of small fruits was much less than an average of the last three or four years. This falling off may be attributed to the continued cold of last winter and spring. In Holmes and adjoining counties, most of the vines and canes of tender grapes and berries were frozen to the ground. Some of them, both top and root, were entirely killed. Strawberry plants, unless well mulched, and growing on a rich, warm soil, fared no better. In some localities, on plants that did get through the winter in tolerably good condition, the crop was injured by frosts on the fifth and sixth of May.

STRAWBERRIES.

For hardiness of plant, prolific bearing, large and bright colored berries, I do not know of any variety superior to the Sharpless. Crescent Seedling, Cumberland Triumph, Minor's Prolific, Captain Jack, and Mt. Vernon, stood the winter better, and gave better satisfaction than many other varieties. The latter is valuable for late bearing. Some of our berry-growers complain of the foliage of the Mt. Vernon and Manchester rusting badly.

RASPBERRIES.

For fine quality and early ripening, our most extensive berry-growers place the Doolittle first. For productiveness, and large, firm fruit, the Gregg surpasses all others. Unfortunately the canes, in some localities, are badly injured by rust. Souhegan is a good and early bearer, and with some, Shaeffer's Colossal is the favorite. Of the red berries, I think Cuthbert is the best.

BLACKBERRIES

are not much cultivated here. In good, bearing years, the wild fruit is so very abundant that it can be, and is gathered and sold at one-half the price asked for that pro-

duced by cultivation. As to quality, much of the wild fruit is equally as good as that cultivated.

GOOSEBERRIES AND CURRANTS.

The larvæ of the *Nematis* (currant worm) is so destructive to the foliage, that unless the bushes are attended to at the proper time, they soon die. But few bushes are now planted. I know a few men who sprinkle their bushes with a solution of white hellebore two or three times during the summer. Their bushes are always in a healthy condition, and produce an abundance of very fine fruit.

GRAPES.

This delicious fruit was nearly a failure. The best and hardiest varieties, Concord, Moore's Early, Ives' Seedling and Clinton did not produce more than half the usual crop. Hartford Prolific, Martha and Delaware not over a fourth crop, and other varieties none at all. The hardiest vines were very late in leafing out. None of them blossomed well, and therefore did not set much fruit, and that which was set, commenced rotting early in the season. Most of the grapes that matured, were inferior in quality. The best bunches I saw this year grew on Mr. Newton's new, early seedling.

LARGE FRUITS.

APPLES.

In Holmes and adjoining counties, the apple is the standard fruit crop. The cultivation of choice varieties of apples, has, for many years, been the study and practice of our leading fruit men and farmers. I am proud that I can truthfully say, Holmes county maintains her reputation in this branch of industry, and is not surpassed by any of the adjoining ones—perhaps not by any in the State. Our crop this year was not over half as large as that of 1884, but more than the crop of 1883. Probably about equal in quantity to that of 1882, but better in quality. I think our apple growers will realize more money for those sold, than they did last year. Large as this crop usually is, it would be greatly increased if we had a better home market. The facilities for shipping are chiefly confined to one railroad, and on that, freights are too high to make apple growing very profitable.

The varieties that produced the largest crops this year are:

Summer.—Astrachan, Sweet Bough, Chenango Strawberry, St. Lawrence and Gravenstein.

Winter.—Baldwin, Smoke-house, Northern Spy, Grimes' Golden, Gloria Mundi, Smith's Cider, Pennock, English Golden Russet, White Pippin and Tulpehocken.

I do not wish to be understood as recommending all these varieties for cultivation, but they were the heaviest bearers. The Sweet Bough, Gloria Mundi and Northern Spy seldom produce good crops. In our county, the following varieties generally give the best satisfaction:

Summer and Fall.—Astrachan, Duchess of Oldenburg, Early Harvest, Orange Sweet, Chenango Strawberry, Maiden's Blush, Gravenstein, St. Lawrence, Cooper, and Cayuga Red Strak.

Winter.—Baldwin, Ben Davis, Peck's Pleasant, Smith's Cider, Grimes' Golden, H. Nonesuch, Smoke-house, White Pippin, Belmont, Rambo, Rome Beauty, Tulpehocken and Willow-twig. A few others might be included, but the above are among the very best, and are all profitable.

It is generally conceded that a northern aspect for the orchard is preferable to a southern one, and that very high land is the best for apple-growing. From the results of this year's crop of fruit, it is difficult to decide which is the best. Two apple orchards in the vicinity of my home, and about three miles apart, one having a northern and the other a southern aspect, were by far the most productive orchards in the county. The soil and sub-soil on which they are growing is the same. Each are at an altitude of about 950 feet above sea level, the trees are of the same age, and mostly the same varieties, Baldwin being the leading one. If there was any difference in the quantity per tree and quality of the fruit, it was in favor of the southern slope. Between these orchards there are more than a dozen, some of them growing on the same kind of soil and at the same altitude, and others 100 feet lower, or 150 feet higher, some older trees, and some about the same age, and mostly the same varieties of fruit. Some of the intervening orchards were under as good a state of cultivation as the two first mentioned, but none of them produced over one-fourth as much fruit per tree. Can any one account for the difference in the quantity of fruit produced?

PEARS.

This crop was unusually large and good; the best we have had in our part of the State for many years. For size and beauty, Clapp's Favorite stood first, and Flemish Beauty second. For hardiness of tree, and productiveness of fruit, Louise Bonne de Jersey stands first. Belle Lucrative, Kirtland, Howell, Sheldon, Beurre d'Anjou, Lawrence and Vicar all bore good crops. The Tyson and Seckel are good bearing, hardy trees, but the size of the fruit renders them objectionable. The Barlett bears well, but the tree blights so badly that it is nearly discarded. The Kiefer bore well, and the fruit was good size and beautiful, but in quality needs further testing.

QUINCES.

This crop was not a large one, but nearly an average. The fruit was very good, being both large and smooth.

PEACHES AND PLUMS.

As usual, these crops were a failure. Of the former there was none, and of the latter very few, most of which were quite inferior.

VEGETABLES.

In quality and quantity, vegetables of all kinds were good. Potatoes, both early and late, were large, productive and good in quality. In some places the tubers rotted a little, but in most cases the rotting soon stopped. The bugs did a little damage in some patches, but an application of Paris Green put a stop to their depredations.

The crop of Cabbage was the best we have had for several years. The Tomato crop was a light one. The fruit was very large, but did not ripen well, most persons complaining of its rotting badly. The crop of Pumpkins and Squashes was immense. There were more varieties on exhibition at our County Fair than I ever before saw there at one time. Turnips were also very good in size and quality, and the quantity large.

AD-INTERIM REPORT FOR ROSS COUNTY.

By J. P. STREEPER.

Mr. President and Members of the Society:

This closing year has been one of average success for fruit-growers in Southern Ohio. Mercury at 16° below zero on February 20th, left scarcely a live bud on budded peach trees. A few seedlings, in favored locations, gave a fair crop. To those who were so fortunate as to have bearing pear orchards, was made up the loss of the peach, in a bountiful crop of pears. Nearly all varieties of this luscious fruit were fine and highly colored.

Apples, were, I think, hurt by the winter cold, and cold rains when in bloom. There has been much complaint of imperfect fruit. Early apples were scarce, but in many locations the winter varieties were good. Cherries may be said to have been a fair crop. Grapes about half a crop, but prices good, better than in New York or Philadelphia.

Plums and quinces about one-fourth a crop. Currants plentiful. Blackberries nearly all winter killed. There are but few cultivated blackberries in Ross and the adjoining counties south, but hundreds of acres of wild ones.

Raspberries, both black and red, were abundant. The Chapman, for a black, is the most productive for our section, and is more generally planted than any other of the black varieties. If well cared for, it will hold in good bearing condition for eight or ten years. Some growers have planted the Gregg, but it appears to be unsatisfactory in our clay soil. Souhegan and Mammoth Cluster are grown to some extent. Of the red varieties, Reliance, where it has been tried, is the favorite. The plant is hardy and grows well. The berries fill the boxes, and will carry well to market, if properly handled.

The strawberry crop was fine. There were no severe frosts in the spring to injure the blossoms; as a consequence, the fruit was full and perfect. Crescent is the leading variety for our free-stone clay soil. It is larger, sweeter, and more firm than the same variety grown on a black soil. If properly fertilized, it will produce more bushels to the acre than any other variety yet tested on our soil.

By invitation, I attended, on June 24th, the Stark County Strawberry Festival, held at Canton. The time was opportune, as our strawberry crop was about over. Their display of berries was fine indeed—worth going miles to see, and the cordial reception we received, made the visit one of enjoyment.

Being desirous to learn something of their manner of raising berries in that county, I visited the farm of Mr. Watson Wise, near Canton, and there saw a most prolific field of strawberries. He had only two varieties that he grew for market—Downing and Green Prolific. They were in matted rows, planted alternate. His field was one and one-third acres, and he estimated the yield at three hundred bushels, and from the appearance of them, I judge he was not disappointed.

His soil is a clay loam, with gravelly sub-soil. He manures heavily the previous year with stable manure, and raises garden vegetables. In this way, he has his ground in fine condition for setting his strawberry plants.

The awakening interest in the profits of small fruit culture and the increased facilities for marketing, have, within the past ten years, induced many to engage in the business. Where, ten years ago, there were five growing small fruits, there are now fifty, and prices are well sustained.

The *Ad Interim* report for Franklin county, by Mr. W. J. Green, was then called for. In Mr. Green's absence, his report was read by the Secretary.

AD INTERIM REPORT FOR FRANKLIN COUNTY.

By W. J. GREEN, OF COLUMBUS.

Horticultural interests in this county have been in a backward state for some time. The soil and climate are not well adapted to general fruit growing. Apple trees are dying off, and young trees have not been generally planted to fill their places. The crop was good in a few orchards, but generally light. The pear crop was much better than usual, but comparatively few trees have been planted. The climate is so changeable and rigorous that it is useless to plant peach trees. Grapes rot so badly, and the vines suffer so much in the hard winters, that vineyards are unprofitable.

A few years since, it was common to hear the remark that vegetable gardening is much more profitable than fruit growing, but now, the opinion, so far as small fruits are concerned, is reversed, as it is much harder to compete with shipped vegetables than with shipped fruit. In consequence, many are abandoning the former for the latter occupation. It is found that small fruits may be grown with considerable success, and their cultivation has attained no little importance. There is room yet for expansion, for there is not enough fruit grown, by half, to supply the home demand. If there were no fruit shipped here, Columbus would have to pay fancy prices for its supply. Last season, however, the shipments to this point were so large that the market was broken down. This would seem to have dampened the ardor of new beginners, but it appears only to have awakened in them the desire to go into the business. The result cannot be foretold, but prices are not likely to rule much lower than last season, and consumers will be better supplied with fresh fruit.

The situation is surely encouraging, as long as the home supply is not equal to the demand, and after the city is supplied, there are the towns round about, and a paying market may be found among the farmers. Very few farmers grow sufficient fruit for their own use, but most of them would buy it, if they could do so conveniently. A few years ago, it was possible for very few to purchase fresh berries in their own neighborhood, but at the present rate of progress, it will not be long before farmers will be supplied at their doors. This is as it should be, for fruit growing is a profitable business, and fruit eating is healthful.

The Experiment Station has done much to awaken and keep alive this interest. There have been many inquiries as to the best varieties to plant in this neighborhood; and, as a report of this kind has more or less general value, it is not out of place to embody some observations made at the Station during the season.

STRAWBERRIES.

This crop was excellent, both in quantity and quality. The varieties that have given the best satisfaction here, are those most generally cultivated elsewhere; the only notable exceptions being the Downing, Wilson, and Manchester. These have partially failed because of the rust. The Crescent, Sharpless, Kentucky, Miner's Prolific, and Cumberland have been planted quite largely, and are our best varieties.

Sharpless is somewhat tender, and does not give as good results as in more favorable localities. Cumberland is not productive enough, but is, perhaps, profitable where a few prize berries are wanted. The berries of the Sucker State are nearly equal to those of the Cumberland in size and flavor, while the plants are much more productive. This variety is deserving of more notice than it has received. Windsor Chief is another variety that has been neglected. Prince of Berries has not given satisfaction. It may possibly prove of value for home use, as the berries are of excellent quality. Atlantic, James Vick, Daisy Miller, and Mrs. Garfield seem destined to be dropped from the list. Jersey Queen is still on the doubtful list. Old plants have borne fair crops, but one year old plants have shown but little fruit. The Manchester has shown the same weakness here as elsewhere; i. e., a liability to attacks of rust. In this respect, however, there was a marked difference between the plants in the old and new bed. The rust was noticed but little on the new bed, set the fall previously, but on the old bed, every variety subject to its attack suffered greatly. The Cornelia is all that has been claimed for it as to size and lateness, but the plants are not quite so vigorous as could be wished, although apparently healthy. Crawford's No. 6 bore some magnificent berries. Ohio, a variety to be sent out soon, is as late as the Kentucky, which it resembles very much, and apparently is about twice as productive as that well-known variety. The Wonderful, which was disseminated last spring, proved to be the Windsor Chief. Much has been claimed for the Jewell, and, judging from its behavior here, much may be claimed for it. The plants are vigorous, healthy, and productive. The berries are large, but sometimes irregular. Its most serious fault seems to be lack of uniformity in size of berries and occasional irregularity. The Parry is another variety that seems not to have been over-praised to any great extent; no more, at least, than might be expected when it is desirable to tell all the truth possible. The fruit stalks are very long, causing the berries to lie some distance from the plant. Under some circumstances, this might be a serious fault. May King and Henderson have not been tested fully, as the plants were sent by mail during very hot weather and arrived in poor condition. Plants received since have grown well, especially those of the May King. A new variety, called Ford's Seedling, which originated with Mr. J. B. Mitchell, of this county, is quite promising. The plant is quite as fine as Miner's Prolific, and colors more evenly. The plants are vigorous; some liability to rust.

RASPBERRIES.

Gregg, Ohio, Turner, and Brandywine are the most generally grown. Tyler and Souhegan will be planted to some extent next spring. The Gregg and Ohio have both been winter-killed to some extent during the last two winters, but this is partly due, at least, to lack of thorough drainage. Nemaha and Hilborn have been planted, and have made a fine growth, but have not fruited. The Cuthbert plants were quite badly killed by the cold, and have borne but little fruit. Hansell plants, growing in the same row, were injured much less, but the crop was not large. This variety has proved to be no larger than the Turner, while the fruit is not of so good quality. Superb and Crimson Beauty were also injured, and gave light crops. Shaeffer's Colossal exhibited one weakness. Many of the canes died after the fruit had set. The crop was, however, quite good. A visit to Mr. Streeper's fruit farm at Chillicothe, when the Reliance was in bearing, convinced me that he has not rated it too highly. The fruit of the Montclair resembles the Reliance considerably, and, but for its being rather softer, the former variety might be rated quite as high as the latter. The Marlboro seems to have been quite fairly rated. The plants are hardy, but not quite as vigorous as supposed. The fruit is very firm and attractive, but the quality, as is well known, is not first rate. It is rather later than the Hansell.

BLACKBERRIES.

These can be disposed of by the statement that the Snyder is the only perfectly hardy variety tried. Taylor and Stone's Hardy rank next.

But few of any variety are planted in this vicinity, the market being supplied with wild ones. The Lucretia Dewberry, it seems, might be made to fill a gap. As seen growing upon a variety of soils upon Mr. Albaugh's place, it would seem to be adapted to almost any locality. How well it may be adapted to cultivation for market remains to be seen, but no one need be afraid of being humbugged by giving it a trial.

Currants and gooseberries have proved to be quite profitable in this vicinity, and the crop, last season, was good. Nothing can be reported as to new varieties, al-

though a number are on trial. Fay's Prolific has been growing three years, but has shown little fruit.

A few remarks concerning the condition of the market in this city last season seem not to be out of place.

Many of the berries shipped here were better than the home grown, but, if we may believe the dealers, they were sold for less at wholesale. It is an undeniable fact that hucksters sold berries on the streets for less than home growers received at wholesale. This may be owing to three causes: 1st. The condition of the fruit when received. 2d. The efforts of the commission men to undersell each other. 3d. The small measure given by the hucksters. This is a matter worthy of consideration, if shippers do not wish to ruin themselves and others also. It might be a good plan for shippers to have some one here to look after their interests and not overload the market. Commission men, perhaps, do the best they can under the circumstances, for, with a large stock on hand, and a probability of an unknown quantity coming, they must sell at any price offered. The huckster question is one with which the city authorities are trying to deal, but their success does not seem assured. Home growers are likely to take the matter into their own hands, and supply customers at retail with fresh berries. This is, perhaps, the simplest solution of the problem of low prices.

AD INTERIM REPORT FOR CUYAHOGA COUNTY.

By E. H. CUSHMAN, OF EUCLID.

Officers and Members of Ohio State Horticultural Society:

As we take a retrospective view of the past year, we find it has been a peculiar one—one which has tried horticulture in all its branches, and again we can record fair harvests, if not high prices.

The severe cold and sudden changes in the latter part of the winter of 1884-85, brought fear for the fruit harvests to every one interested, and it was not without good foundation. On examination, it was found that peach, cherry, and plum buds were killed, some peach trees were killed, and many had the bark of the trunk split from branch to root. The more tender varieties of grapes and blackberries were greatly injured. Raspberries, currants, gooseberries, and strawberries came through in good condition.

An unusually late spring was followed by a warm, wet June and July, swelling out the berry-crops to their fullest capacity, gladdening the grower with a full harvest and the consumer with cheap fruit. July was followed by a cold, wet August, and the vine-grower went about his labors with fear and trembling, and it was not without cause—rot and mildew attacked the Catawba and Delaware, respectively, doing little harm to the Concord. The last three weeks in September were very fine, and with a fair October, the most active part of the horticultural year was brought to a close.

All kinds of fruit trees have gone into the winter in fair condition, and with a mild winter, we may reasonably expect good harvests next season.

As much of the success in horticulture depends on the weather, perhaps it would be well to take it up a little more in detail.

The coldest day in January was 7° below zero. The mean temperature for the month was 20.9°, averaging slightly less than the corresponding month last year.

February was the most severe on fruit trees and vines. It was during this month the mercury fell in forty-eight hours some 40 or 50°, and reached 15.1° below zero on the 11th. The average temperature for this month was 16.4°, or 11.1° lower than the preceding February.

March was an intensely cold month, the mercury going below zero several times.

April and May were about the same as usual. The latter part of May was unusually warm, and all vegetation started into rapid and healthy growth.

The heavy precipitation of moisture in June was a very noticeable feature of this month. The amount of rain-fall was 7.22° inches—more than double that of last year. The average temperature was 64.4°, or three degrees lower than last season. July was a fine month, with an abundance of rain and warm days. The rain-fall was 4.48 inches. The average temperature was 71.06°; the hottest day was on the 17th, being 90.01°, the highest point reached during the year. The growth of all vegetation during this month was strong, not excluding the weeds.

August came in cold and wet; the average temperature for this month was 65.8°, not as high into 3° as the August of 1884.

The first week in September was a continuation of August weather, followed by nice, warm, dry weather, which tinted the grape and made its ripening a certainty, and brought the apple and pear to perfection.

October and November have been unsettled, but few warm dry days were had for harvesting late fruit and vegetables.

STRAWBERRIES.

The crop in the vicinity of Cleveland was very large, owing to the extended acreage and moist weather during the ripening season. The prices were low, starting in at \$8.00 per stand for Wilson's, they fell to \$1.00 at the heaviest pickings, which did not pay for gathering. One grower traveled fourteen miles to sell twelve stands, and made a profit of sixty cents on the lot, over and above picking. Finer varieties brought from \$1.00 to \$2.00 more than Wilson's. Many growers who have been making the larger berries a specialty, say they do not pay as well as the smaller varieties. The leading varieties in the Cleveland market are Wilson, Sharpless, and Jucunda. Vines set last spring have not done as well as many expected, and the acreage is not as large. The cultivation of this fruit has assumed enormous proportions. One commission merchant told me he received on the three heaviest days 1,190 bushels, and thought he had about one-fifth of what came in on those days.

RASPBERRIES.

Strange to say, this class of fruit suffered very little by the cold; even the tender Naomi was not injured. The crop was light and the prices fair; they sold at from \$2.00 to \$3.00 per bushel, red and black bringing about the same prices. Gregg takes the lead in black, and Brandywine and Cuthbert hold the same rank in the red. Brandywine is the most hardy.

BLACKBERRIES

Were a light yield. All the varieties except Snyder were injured by the winter. Snyder bore a heavy crop of berries. Taylor was hurt some, but bore a few nice large berries. Early Harvest was killed down to the snow; it ripened a few berries on the 15th of July.

MULBERRIES.

We have on our place two Downing's ever-bearing Mulberry trees, planted eight years ago. They have borne three successive crops of fruit. The berries begin to ripen in June, and are in their prime about July 4, and last until the latter part of August. They make a most toothsome pie, and are very tasty from the tree, as the birds can testify, taking 499 out of 500. The trees are beauties in form, have full glossy foliage, and are well fitted for the lawn, and would be my second choice for ornamental planting, all things considered.

CURRENTS

Were a short crop, and in good demand, selling from \$3.00 to \$4.00 per stand, Large Red selling at an advance of 50 cents over Red Dutch.

GOOSEBERRIES

Were plenty, and sold at \$2.00 and \$3.00 per stand, locally.

PEARS.

There are no very large Pear orchards near Cleveland. Most of this fruit is grown rather promiscuously. The yield was abundant, and quality good. A few trees were hurt by the winter; have not noticed any blight this season.

APPLES

Are not as plenty, nor as good in this section, as last year. The apple crop is a sort of side-show to general farming, very few orchards receiving any special attention. Tallman and Pound Sweet seem to be less grown, and the demand for them is increasing.

THE GRAPE.

This one, of the many fruits, probably receives more attention, and brings a greater revenue with the same amount of outlay per acre, in northern Ohio, than in any other part of the State, if not in the United States. Its culture in the section east of Cleveland is gradually extending; the limit will only be reached, when it can not be grown at a profit, or disease and death arrests its growth. I refer more particularly to the Concord variety. The Catawba and Delaware are being planted, but with varying success. These three kinds are the most popular, and are depended upon as staple.

The Concord yielded heavily of fine, large, luscious clusters, and were more exempt from cracking than on previous years, and sold from $2\frac{1}{2}$ to $4\frac{1}{2}$ cents per pound. The vines of this variety were not injured by winter. In some localities it was slightly troubled with rot; this was more perceptible west of Cleveland than east.

The Catawba was badly injured by the sudden fall of temperature in February. Many did not trim until the buds became well advanced. The wet weather in July and August was favorable for the rot, and the consequence was, the fruit left by Jack Frost was spoiled by the equally dreaded black rot. As a result, the crop was, light and unsatisfactory.

Delaware escaped the cold of winter, but was badly mildewed by the cold and wet August. The leaves fell prematurely, leaving tons of partly ripened fruit hanging on the vines.

The Worden is attracting considerable attention among growers, and is being largely planted instead of Concord, by those who know it, and promises to be the leading black grape in a few years.

Martha still holds supremacy for a white grape; it is healthy and hardy.

Brighton has come to stay; it is a little tender, but is considered sufficiently hardy to guarantee planting. It is a fine grower, prolific, and free from disease, so far as tested. It has borne two crops for me, and in my judgment it is a little inclined to set more fruit than it can mature.

Moore's was hardy last winter, and is gaining favor as an early black grape. It is very sour when first colored, and takes a long time to sweeten up.

Pocklington stood the severity of the winter, and promises well for a white grape of fine appearance. If the Empire State does not supersede it, it will be the leading white grape for market, the Niagara notwithstanding. Too many white grapes are at a discount, at best.

Highland, Jessica, Ulster, have fruited with me this season for the first time. Highland is a moderate grower, hardy, and bears fine showy bunches, but not very good flavor; in truth it lacks flavor. It ripens with the Catawba.

Jessica is a hardy, strong grower, ripens ten days earlier than Martha, but not quite as early as Lady. In my opinion it has no particularly valuable points.

Ulster was set this spring; the roots appeared to be three or four years old. The vines were sturdy, and grew well, producing a few small clusters. The grape has a tough skin, is very sweet, has a flavor akin to Diana, and ripens with Catawba.

Poughkeepsie Red set this season has made a very weak growth. The plants were good strong ones, and it was favored all through the season.

Jefferson grows well, but it is too tender for our climate. It has the reputation of ripening its fruit unevenly.

Lady is vigorous, and a fine early white grape, has a very tender skin, like the Concord in this respect; some seasons it is much tougher than others.

Victor is considered as not having any very desirable traits to recommend it; another season may change opinions.

Vergenes is hardy and thrifty, skin thick; it adheres to the peduncle strongly. The bunches look well but flavor is not agreeable to my taste.

Empire State has grown well, and has fine, healthy foliage.

Niagara did not stand the winter. It is a vigorous grower, and prolific. I think it has gained its popularity mainly from the manner in which it was introduced.

An early, black seedling, grown by Mr. R. A. Hunt, from Delaware seed, and exhibited at the summer meeting, has attracted some attention from vineyardists and nurserymen this summer. It is thought to have some real merit, notwithstanding the severe criticism it has received. Its vigor, hardiness, productiveness, earliness and tough, thin skin, are its strong points. It was well colored on the 20th of August, and far ahead of Ives Seedling.

The rapid increase and cheapness in tropical fruits is worthy of mention; especially is this noticeable in the Banana trade. All commission houses of any pretension have, as a part of their furnishing, a room for ripening this fruit in the cold season.

At this time of the year, the Banana comes to our northern market as green as a cucumber. Each bunch is in a paper sack, and in extreme cold, two sacks are used. They are taken from the sacks and placed in the ripening-room. This room is airtight and fitted with numerous gas-jets or other heating appliances. The length of time the fruit remains in this heated room, varies. The temperature is kept at about 75°. It requires a person of some experience to conduct this process, and in this the Italians excel. The receipts of Bananas for Cleveland amount to about 180,000 bunches in the year, or two car loads per working day. One year ago, a truck load brought \$2.25 per bunch, and can be purchased now for \$1.25. Where a year ago a profit of \$1.00 per bunch was not uncommon, many are now sold at a profit of five cents.

Lemons are more plentiful than formerly, and sell at very low rates.

Oranges are less of a luxury, and large truck loads are to be seen for sale at almost every corner of the main thoroughfares of our Forest City. It is estimated that two years ago, nineteen-twentieths of the oranges were imported. Last year not more than 50 per cent., the balance coming from Florida and California. If the railroads will give the growers low rates, quick time, and the right kind of cars, the foreign orange will be a thing of the past. It was not an uncommon sight the past season, to see Apricots and Nectarines exposed for sale that came from California orchards. They looked very tempting, and sold for the *modest* price of 75 cents per dozen.

Garden truck has been plentiful and cheap; in fact, so cheap that many gardeners feel discouraged. The southern watermelon is so much better, and just as cheap as our own, that it has almost driven home-grown melons from our market. The same fate is very likely to overtake the early tomato crop. The method of picking, packing and shipping the southern tomato has so much improved within a year, that we get better fruit at lower prices than we can grow or afford to; especially is this true of the southern Illinois product. The Acme, Trophy, and Livingston are the favorites in our market. The cabbage crop was very large, and was little troubled with the worm. The worms were plenty and vigorous on my late cabbage up to the 15th of September, when I noticed some of them were sick and looked white, and in a week or less not a live worm was to be found. I think they must have been attacked by the same disease that has caused their disappearance in some parts of Illinois. Prof. S. A. Forbes says, "It is a contagious disease, closely allied to the *flacherie* of the silk worm." Let it be what it may, I hailed it with joy, as I know all lovers of this vegetable will.

The potato crop was good; the tubers are bringing a fair price. Burbank is the leading variety. Rose is failing; Early Ohio holds its own; Queen of the Valley is a good late-keeping variety. It may not be known to Ohio potato growers that many of our potatoes go into the southern market branded "Boston" instead of "Ohio." Particularly is this the case in the New Orleans market. The reason assigned for this is, the Ohio brand is known in the South as a wet, soggy, poor keeper, which comes from the potatoes grown in portions of southern Ohio being shipped to the South before our dry, fine-grained Western Reserve potato had established its reputation as such; consequently it became necessary for northern Ohio shippers to use the "Boston" brand in order to command the best price. The Boston has a good reputation, upheld in part by our own production.

Onions were a good average crop, but yield light to the acre.

Celery has been of fine quality, but light supply of home grown. Kalamazoo celery is having a depressing influence on our market.

All kinds of root crops have done well, and are unusually sweet when prepared for the table.

Squashes and Pumpkins have outrivalled themselves in number, quality, and size. In my opinion, the best method of foiling the bug is in late planting, say the last of June.

In entomology, nothing of note has attracted my notice except the disappearance of the cabbage-worm, as mentioned above. The wire-worm has done considerable damage to the potato and strawberry in some places. The ravages of the currant-worm is killing many of the bushes, and the consequence is, shortening the crop and increasing the price. As many farmers had more of this fruit than they could use, the surplus was taken to the market. Now the professional produces the most of it.

In ornithology, the increased abundance of the Robin and Cat-bird was noticeable. The Cat-bird was very tame this season, almost too much so. The red-headed Woodpecker, Wren, and Red-bird were conspicuous for their absence. One case of the English sparrow eating currants came under my observation. This little marauder

suffered severely last winter, many of them starving and freezing to death. However, they have fully recruited their ranks during the summer.

— Among the objects of interest to the Euclid fruit-growers this season, has been the erection and trial of a cold storage house, erected on Mr. Hunt's farm, at Euclid, by Messrs. Kendall & Hunt. This is a fine-appearing and well finished building, 100x32 feet, with a 20 foot post, and cost about \$7,000.00. The storage room proper is 80x32, and has a capacity of 200 tons of grapes. In front is a neat office and packing room, and underneath is a cellar. The storage room is kept at a temperature of 38° by ice placed on a galvanized iron floor. This floor is a patent, and costs ten cents per square foot for the right to use, and six cents laid. Mr. Kane, of Cleveland, is the patentee. The floor in this house is capable of sustaining 500 tons of ice. It is filled direct from a pond by the side of the building. The building was finished so late this season that it will not have a thorough trial. However, the proprietors have some 40 tons of grapes, and several car loads of apples in it.

I visited Lancaster, on the 15th of September as a member of a special committee, to investigate viticulture in that locality, and must say I was quite surprised to see so good a showing of grapes as some varieties produce; a full report of which will be presented to this Society.

The taste for horticulture and rural embellishment among the people is gradually increasing, but not as fast as true lovers of Nature's beauties could wish. A general spirit of improvement prevails among farmers, which manifests itself in clearing up road-fences, and all unsightly places, planting out shade trees along the street. The favorite varieties of trees are soft and hard maple, elm, Lombardy poplar, and bass-wood. One great and general mistake in setting out roadside trees, is planting them too near together. They should be set at least fifty feet apart, and seventy-five feet would be better. Trees set too near together, fail to develop their natural symmetry of form.

Far too many ruralists neglect to have plenty of all kinds of fruits on their premises. I see no marked improvement in this respect over former years.

The primal object of this Society is more fully met than the second. We do not reach a very large class of those whom we seek to enlighten. The professional plant, and fruit-grower come here to look after their own individual interests, but if we reach the people as we should, and make this State "to blossom as the rose," we must adopt a more systematic course of work in this direction. The people are ready—it is for us to plan and execute.

Secretary asks if the grape mentioned by Mr. Hunt is yet named.

Mr. Cushman.—No, sir, he has not yet named it, preferring to keep it in his own hands until he has tested it more thoroughly. There are other seedlings in our town, but it is desired to keep them out of notice until they have been thoroughly tested.

The Secretary remarked that specimens of this grape had been sent him by Mr. Hunt. It was a black grape of medium size, and though well colored, was not ripe. It appeared to be one of the class that colors sometime before real maturity. As it was unripe, no accurate estimate of its quality could be made; but he thought it would be more likely to have value as a wine grape, than for the table.

AD INTERIM REPORT FOR RICHLAND COUNTY.

By F. R. PALMER, OF MANSFIELD.

President Ohmer and Gentlemen of the Ohio State Horticultural Society:

The year 1885 has been one of less than average success to the practical fruit-grower in Richland and adjoining counties. During the summer of 1884, we suffered from intense drouth. This was followed by the most severe winter ever known in the history of Ohio.

In Richland county, the mercury in our thermometer dropped below zero forty times during the winter, and, I think, at least a dozen times from 15° to 25° below. Another very remarkable thing was that our thermometers registered several degrees below zero for seven successive days in March, a thing perhaps never before known in Ohio. The result was that the fruit buds on peaches, plums, and cherries were

all killed during the winter, and during nearly all the growing season of 1885, we have suffered from excessive rains and want of sunshine.

APPLES.

There was a fair show of blossoms on most of the apple orchards. But from some cause, which we are not prepared to explain, most of the fruit dropped soon after blooming. The result was a very light crop, and that made up of imperfect specimens. The apple crop of Richland county is not near equal to the demand for home consumption, and we are being supplied from Northern Indiana and Michigan. The varieties yielding the most fruit in our vicinity during the past four unfavorable seasons, are Grimes' Golden, Jonathan, Baldwin, Willow Twig, Danvers' Winter Sweet, Talman Sweeting, Ben. Davis, and Transcendent Crab.

PEARS.

An average crop, but many defective specimens, notwithstanding the past severe winter. There was less blight this year than usual.

SMALL FRUITS.

These wholesome and refreshing summer fruits yielded a better return for the labor bestowed on them than tree fruits, but the quality, especially of the strawberry, was not up to its average, owing to excessive rains and want of sunshine.

Mr. A. A. Geroe, the most extensive small fruit dealer in Toledo, told me he had handled strawberries for many years, and never saw them so insipid and poor in quality.

To the commercial fruit-grower, the Crescent Seedling, Windsor Chief, Manchester, Wilson, Kentucky, and Bidwell produced the most satisfactory crops.

The pistillate varieties are the surest and most abundant bearers, but to secure the greatest success, they should be planted in alternate rows with staminate varieties. Manchester and Kentucky are late varieties, and should be planted together in order to insure perfect fertilization of the Manchester. Bidwell and Wilson are good fertilizers for Crescent and Windsor Chief. Bidwell should be kept to "hills" in order to secure the best yield.

Many growers recommend planting half a dozen rows of a pistillate variety, then one or two rows of a staminate. I am satisfied that this does not secure sufficient fertilization. What is worth doing, is worth doing well. As evidence of the propriety of close planting of pistillate and staminate varieties, I will say that Mr. V. Tucker, of our county, planted one-fourth of an acre of Crescent Seedling and Wilson, mixed promiscuously all through the patch, so that they came in close contact with each other. The result was, that he gathered sixty-six bushels of nice berries from the quarter of an acre. Now, these practical tests and successful results are pretty safe criterions to judge by and pattern after. The newer varieties that appear to possess merit to recommend them to public favor, are Daniel Boone, Bright Ida, Mrs. Garfield, and Sucker State. Those comparatively unworthy of further cultivation, are Big Bob, James Vick, Piper's Seedling, Old Iron Clad, and Grendale. Atlantic, Parry, Cornelia, and other varieties we need more experiment with, before expressing opinion.

CURRENTS.

Are perhaps more neglected than any other fruit of its comparative value. One reason is that people do not understand the natural habits of the plant. The currant bush renews itself from the root, and the old wood should be removed every three years. The renewal system is the proper method. Four or five canes in a hill is all that should be allowed to grow. An annual application of coal ashes about the roots, and the same care in cultivation which the average farmer gives his corn, will secure good crops. The currant worm is easily destroyed if attended to in time. "Hellebore" will kill insects just as it did before the new version. Fifty cents worth properly applied, will "play hob" with all the currant worms on half an acre.

RASPBERRIES,

where well cultivated and cared for, produced a very satisfactory crop, considering the unusual severity of the winter through which they had passed.

The Gregg, Ohio, Souhegan, Beebe's Golden, Shaeffer's Colossal, Brandywine, and Hansell were most successful with us. One acre of Gregg in our neighborhood

yielded ninety-six bushels, and on our own place we gathered thirty-six bushels of Shaeffer's Colossal from one-third of an acre, notwithstanding the severe winter killed elder bushes down to the snow line, within ten rods of the berry patch. The "Marlboro" produced very fine specimens on spring set plants, and it after trial, it sustains its present reputation for hardiness of plant, I regard it as the coming red raspberry for market.

We have been growing raspberries from seed for several years, but have never succeeded in producing a red raspberry possessing sufficient merit to recommend it for general cultivation. But we have a black cap seedling, four years old, that is superior in every respect to any early black raspberry I ever saw. We had forty plants this year, one year old, that produced fully twice as much fruit as any other black raspberry on the place of the same age. It is as early as Souhegan; ripens its crop so as to be gathered at three pickings, and go into market before the Gregg ripens. The bush is a strong grower, entirely hardy, enormously productive, and the fruit larger, firmer, and of better quality than either Doolittle, Souhegan, or Tyler, and will remain firm on the bush three days after being ripe. This seedling was the only raspberry, black or red, that passed through the extreme severity of last winter without injury in Richland county. The next most hardy, were Beebe's Golden, Shaeffer's Colossal, and Caroline. All varieties succeeded best on elevated sites and well underdrained clay soil, and especially on a northern slope.

BLACKBERRIES

are not grown to any great extent in our vicinity, yet a few small patches of the Snyder bore a good crop, although most of the wild bushes in fence corners were killed.

POTATOES,

on dry lands, where well attended, produced an average crop, but on wet, clay lands, not underdrained, this crop was a failure. The early varieties were most successful, as a killing blight struck the vines of late kinds before the tuber reached maturity; hence, they failed to ripen, and rotted badly. Clark's No. 1, Beauty, of Hebron, Telephone, Lee's Favorite, and other early varieties ripened, and escaped rot.

GRAPES,

on vineyards were an entire failure, not from any defect in the soil, or disease of the vine, but from unfavorable atmospheric influences, producing fungoids, mildew, and rot. A few isolated vines on elevated sites in the city of Mansfield, ripened their fruit, while the rot destroyed the fruit on the same elevations in the country. The dryness of the atmosphere, and freedom from heavy dews in the city may, in a measure, account for this. We know that excessive heat and moisture produce fungoids and mildew, but have never been able to solve the mystery of grape rot; but will say that I regard it as a purely local infection caused by a parasitic fungus, and not the result of any disease of the vine; nevertheless, if fungoids produce rot, they are so minute as to be invisible to the naked eye; indeed, I have placed grapes in all stages of rot, under a powerful microscope, without being able to discover any predisposing cause. It appears to be the result of unfavorable atmospheric influences over which we can have no control. Yet why it is, that fifteen or twenty years ago we could grow Concord grapes in almost any soil or locality in Ohio, with as much certainty as we could grow corn, is past my comprehension. We know by dear experience that rot blasts and ruins our grapes; we know that blight destroys our pear trees, but the real cause of this blight is an unsolved mystery. We know that a robin's egg is green and a Guinea fowl's egg is speckled; we know that a Jonathan apple is red, and a Grimes' Golden is yellow, but just what in the nature of things produces these different results, is a mystery. That the speculations of many theorists in reference to the cause of grape rot, are without foundation in fact, we could fully demonstrate had we the time, but will not exhaust our time and your patience, as we may briefly refer to this matter in our report on vineyards in Southern Ohio.

The truth is, that the horticulturist, to be successful, must have a good deal of scientific, as well as practical knowledge. It is a very mistaken opinion that any fool knows enough to be a successful farmer or fruit-grower, if he only has bone and muscle, and an almanac to tell him when the moon changes; yet many professional men,

scientific men, would make "magnificent" failures, should they attempt to make a living by fruit-growing, with their present store of knowledge of the business.

By the way, my friends, while it is our duty to endeavor to raise the standard of excellence in fruit and vegetables and increase their productiveness, there is still another very important work, and that is, to encourage the improving and beautifying of our home surroundings by the planting of ornamental trees, shrubbery and flowers. Too many farmers seem to labor under the very erroneous opinion that they are not entitled to any of the luxuries of life, except perhaps, that of chewing tobacco, and paying taxes. There appears to be a prevailing delusion in the minds of many in the agricultural community, that the adornment of their homes is a secondary matter that may be easily dispensed with. Yet we look upon the external appearance of a rural home, as an index to its inmates.

The person who has no appreciation of the beautiful in Nature, most certainly cannot sentimentally and intelligently look "through Nature up to Nature's God," and indeed lacks an essential element of moral and intellectual enjoyment. A home adorned with the beautiful in Nature, is generally the abode of intelligence and culture.

The real elements of beauty in a home, are not costly houses, or any obviously very expensive improvements. They are rather neatness and good taste in arranging the lawn. Princely mansions lose their charms with dilapidated and slovenly surroundings. Flowers are emblems of purity, and those who have no love for flowers, pictures, or music, are generally more or less lacking those social and intellectual enjoyments which constitute the chief happiness of cultivated and refined human beings, and it is a source of pleasure to me to see that this beautiful branch of horticulture is receiving increased attention, and its refining influence growing in all parts of the State.

I had the pleasure of attending the June meeting of the Stark County Horticultural Society, and was astonished to see the magnificent display of fruits and flowers, showing that the interest in floriculture among the people is improving in the right direction. I was also very agreeably surprised to see the interest manifested in the success of the Society, there being about four hundred people in attendance. I also attended the strawberry show of the Lucas County Horticultural Society, at the home of our friend W. W. Farnsworth, near Waterville, and was very favorably impressed with the beneficial influence of the social character of the meeting. Here also luscious fruit and lovely flowers were shown in great variety. The members of the Lucas county Horticultural Society are intelligent and progressive, and the free discussions on horticultural topics were of more than ordinary interest.

The magnificent display in the floral department at our State and County Fairs is also evidence of increasing interest in this pleasing and refining branch of horticulture. New and beautiful flowering and ornamental foliage plants have appeared in great profusion. Indeed in this branch the advance has been truly surprising to those who can look back even fifteen or twenty years. Yet great as has been the improvement, we do not think the perfect flower or fruit has ever yet been produced. There may be a limit beyond which a fruit or flower may not be improved, yet considering the inferior quality of fruits in former days, it is surprising to see how many fine varieties have been produced; and great as has been the advance, we believe greater results are yet to follow. Every year brings out some new fruit, flower, or vegetable, to take the place of those that deteriorate or become unprofitable. Now, my friends, I regard it as our duty to co-operate with Nature in bringing all the useful and beautiful things which the Creator has given us, to the highest state of perfection possible. Success in horticulture depends not alone on natural advantages, but very much upon the intelligence, tact, energy and industry of man to develop its resources. "God helps those who help themselves."

Thus with the means which Providence has placed in our hands, we should all endeavor to do something which will add not only to our well-being, but will bring comfort and happiness to others. Then will our lives not have been spent in vain, and our names will be remembered by those who survive us, with gratitude and pleasure.

Secretary.—I would ask the origin of Beebe's Golden Raspberry?

Answer.—I think it originated in the State of New York.

Mr. Albaugh.—Why is there so noticeable an absence of any reference to cherries in the Ad Interim reports?

Some member stated that they had too few cherries to report.

President Ohmer.—In Montgomery county, we had a great many fine cherries this year, and a great many sweet ones.

Mr. Palmer displayed a cane of Beebe's Golden Raspberry, stating that he nipped his canes at a height of about two feet, leaving four canes to the hill. These immediately start out, and bear new branches. These he cuts at about eight or ten inches from the canes. That is the way you grow raspberries, isn't it, Mr. President?

President Ohmer.—Yes, sir, that is the way we think raspberries should be treated.

A member asks how Beebe's Golden compares with Brinckle's Orange.

Mr. Palmer.—I have not grown that variety for several years. The Caroline is certainly inferior to it in quality. Beebe's Golden was not injured at all last winter, and it bore as full as could be desired.

President Ohmer then called for the report of the local Horticultural Societies.

The report of the Summit County Horticultural Society was then read Mr. Crawford:

REPORT OF SUMMIT COUNTY HORTICULTURAL SOCIETY.

BY M. CRAWFORD, SECRETARY.

This Society was organized nearly four years ago. It meets monthly, at the homes of the members, each person or family carrying a well-filled lunch-basket.

The time before dinner is occupied in visiting and examining the fruits, flowers and vegetables on exhibition, while the hostess and some of the ladies arrange the contents of the baskets on the table.

After dinner, the meeting is called to order, minutes are read and reports of committees received. Usually these reports give rise to extended discussions. The essay is then read and discussed, questions asked, the next place of meeting decided upon, and the essayist appointed.

Our Society is making a moderate and healthy growth. New members are received nearly every month. Our people have a way of bringing extra fine specimens of horticultural products, which add greatly to the interest. Nearly every new thing offered by seedsman or nurseryman is tested by some of us, and all get the benefit. We are fortunate in having as one of our most earnest working members, Prof. E. W. Claypole, of Buchtel College, who is perfectly competent to settle any question in geology, botany or entomology that may come up. He and his wife and sister have furnished some of the most valuable papers read before our Society this year.

E. H. Cushman, from the Grape region of Cuyahoga county, meets with us frequently, and is our committee on vineyards.

Rev. E. H. Otting, of Medina county, comes occasionally. He contributed largely towards making our strawberry meeting a success.

L. B. Pierce is always present when not out of the county, and is our authority on ornamental planting.

Geo. W. Dean, Vice-President of the Portage County Horticultural Society, is one of our members, and one whose words have great weight with horticulturists in our section. We have no scruples about receiving recruits from the Portage County Society, as it has, perhaps, two to our one; and besides, our gain is no loss to it.

Of the rank and file I will say nothing, though they have the good of the Society at heart, and do all in their power to advance its interests.

It is not too much to assert that our Society is a power for good in the county. Our proceedings are published monthly, and bound at the end of the year.

President.—Are there any other members ready to report for their Horticultural societies?

In the absence of the writer, the Secretary then read the following report of the Portage County Horticultural Society:

REPORT OF THE PORTAGE COUNTY HORTICULTURAL SOCIETY.

BY REV. ANDREW WILLSON, SECRETARY.

This Society, organized in February, 1879, has experienced uninterrupted prosperity. During its existence, the receipts for membership fees have amounted to \$571.00, an average of over \$81.00 each year. Besides paying all current expenses, including printing and binding two hundred annual reports, it has purchased a large tent, owns knives, forks and spoons, and a small library of valuable books. Membership fees, this year, amount to \$100.00, eight dollars more than during any previous year, and twenty-eight dollars more than last year. The total membership approximates three hundred.

The monthly meetings have been regularly held, and the attendance has ranged from forty, to two hundred and sixty, averaging, perhaps, one hundred and twenty-five. The essayists have generally responded to the call of duty. The majority of the committees have faithfully attended to their work. The exhibits of flowers, fruits, and vegetables, though not equal to some previous years, has been commendable, and the social feature has lost none of its importance and value. The essays have been able, instructive, and valuable, and have covered a wide range of topics. The young are becoming more and more interested, and have furnished some valuable essays. The practical influence of the Society is visible in increased interest in the cultivation of fruits, flowers, and the adornment of homes and places of public resort. The Society is progressive, its prospects hopeful, and its mission helpful.

The Secretary then read the following communication, inviting the Society to visit the new State Fair Grounds:

OHIO STATE BOARD OF AGRICULTURE, SECRETARY'S OFFICE,
COLUMBUS, OHIO, December 2d, 1885.

To the Officers and Members of the State Horticultural Society:

GENTLEMEN:—The Ohio State Board of Agriculture would be pleased to have your Society, or as many members thereof as can make it convenient, visit the new State Fair Grounds, and view the buildings and other improvements made and in progress, and therefore hereby extend a cordial invitation to make such visit any time on Thursday, December 3, that may best suit your convenience.

Upon your acceptance of this invitation, and the naming of the hour that may suit your pleasure and convenience, the State Board will arrange for a special car over the C., C., & I. R. R., to convey you to and from the grounds, which are, by rail, but three minutes' ride from the Union Depot.

Very respectfully,

JAS. W. FLEMING,
Assistant Secretary.

By order of the Board.

President Ohmer.—Gentlemen, what will you do with this invitation?

After considerable discussion, it was decided that the Society could not accept the invitation at the time stated.

Mr. G. S. Innis made the motion that the invitation be accepted, and the time set at two o'clock on Friday afternoon. Carried unanimously.

The report of the Warren County Horticultural Society was then read, as follows:—

REPORT OF THE WARREN COUNTY HORTICULTURAL SOCIETY (1885).

BY M. A. JAMESON, SECRETARY.

The meetings of this Society have been held as usual during the year, regularly on the second Thursday of each month.

The membership at the beginning of the year was one hundred and seven, and new members have been added at each meeting.

In January, February, and March, the meetings were held at the opera house in Lebanon. The other meetings were held at the residences of members in different parts of the county.

* A number of exceedingly practical papers have been read and addresses delivered before the Society during the year, among which were the following:

In February, by Miss M. Lownes, of Morrow, an essay on "Home Influence."

In March, by Josiah Morrow, Esq., of Lebanon, O., an essay entitled, "Variation in Plants."

In April, by Wm. T. Whitacre, of Morrow, O., a paper entitled, "The Origin and History of Certain Products of the Soil, and their Influence on the Civilization of this Country."

In May, by C. M. Thompson, Esq., of Lebanon, O., an essay—subject, "Instinct and Reason."

At the June meeting, an unusually interesting programme of exercises was carried out, and the attendance numbered fully three hundred and fifty. Rev. William Ashmore, a missionary, lately returned from Swatow, China, was present at this meeting, and, upon an invitation of the Society, gave an interesting lecture, concerning the peculiar methods pursued in cultivating the soil in that heathen land.

Rev. R. S. Hageman, of Camp Hageman, Ohio, followed with an address on Strawberries, of which he then and there exhibited thirty-one distinct varieties, of his own raising.

In July, James B. Graham, of Lebanon, addressed the Society on "Landscape and Flower Gardening."

In August, Mrs. H. P. Danforth, of Maineville, read a paper entitled, "The Happy Medium, or the Line of Equilibrium in All Things."

In September, an essay, entitled, "How Shall We Educate our Sons and Daughters?" was read by Mrs. Samuel Baughman, of Springboro, O.

In October, Mr. Geo. W. Carey, formerly and for a number of years the Secretary of the Warren County Agricultural Society, by invitation, addressed the Society on the "Management of our Agricultural Fairs."

In November, at the Orphan's Home, near Lebanon, the Society was royally welcomed by the officers of that institution, and at this meeting Rev. Wm. Bellar, of near Lebanon, addressed the Society, on the subject of "Horticultural Societies."

These essays were all interesting and practical, and discussions of the various topics treated were engaged in at the respective meetings, with evident profit to the Society.

There has been a constant and continued growth in the Society during the year, and discussions, relative to the cultivation and care of all kinds of horticultural products, have been held at every meeting, with no abatement of interest.

It is confidently believed by many members, that the year just closing has been one of greater prosperity to the organization than any previous one in its history.

The Secretary then read the following letter from an old member of the Society, who had dropped out, but has renewed his membership—Mr. Milton.

YOUNGSTOWN, OHIO, Nov. 28, 1885.

GEO. W. CAMPBELL, Esq.: Dear Sir—Please find enclosed \$1.00 as membership fee for one year, of the State Horticultural Society. I see no members at present from this county on your books.

I intended being at the present meeting to be held in Columbus, but am afraid I cannot reach it. Still, from what I see in the papers, all the leading horticultural talent in the State have been secured by the Society to take part in the discussions, etc., I shall lose considerable enjoyment. The future may make it, however, more convenient to attend, for me.

The proceedings of last year I have, bound with the Agricultural Report. From them I should judge you are getting better as a society. It is the best report I have yet seen issued. Keep on; you are doing a good work.

There are one or two branches of horticulture in which I think your society takes too little interest, namely, horticulture as pertaining to the decorating of our home surroundings, and horticulture in relation to window or parlor gardening. I think, as a State society, standing out as a leader of horticulture in its broadest and most general meaning, should devote time for essays and discussions on the other branches of horticulture besides fruits; this can easily be accomplished by appointing essayists from your members, to read essays on such subjects relating to floriculture, etc., as are most beneficial to the beautifying of our homes, both outside and inside. I do not make these suggestions from any personal interests, as a florist, but do it for the benefit of the society and people generally. A good many people abstain from being members of the society and from attending its meetings, because, as an old

member said to me, "it is all fruit; and a person who does not know anything about fruit, however much he may know about the other branches of horticulture, has no business in that society." While I for one would not go as far as this, still I think there might be a good many changes made which would be beneficial to the society and horticulture generally.

MANFIELD MILTON.

The Secretary remarked: This Society is just what its members make it. If the florists wish to come in and discuss their work, there is no reason why they should not do it. We have appointed an afternoon at this session for the special consideration of these subjects. I think there has been no intentional neglect in this direction.

Mr. Palmer.—I suggest that this Society send a very urgent invitation to Mr. Milton to give us a lecture on Floriculture. It seems to me that the beautiful in our home surroundings is a very important thing. I haven't a report of our Horticultural Society. We have fifteen or twenty very enthusiastic members, and we hold very interesting meetings.

Mr. Leo Weltz stated that during his visit at St. Petersburg he was assured by Dr. Reigel that of all the reports he received, he enjoyed the reports of the Ohio State Horticultural Society the most. At Berlin he was invited to a large exhibition of flowers. He received many expressions of interest in the Ohio Horticultural Society, and distributed a number of copies of the reports.

Secretary Campbell.—Just a word in reply to Mr. Palmer, and in regard to Mr. Milton's letter. He sent me his dollar and renewed his membership in the Society. I wrote him a very earnest letter, requesting him to be present, stating to him that we had appointed Thursday for the discussion of this very subject.

A report of the Delaware County Horticultural Society being called for, Mr. H. McMaster, President of the Society, who was present, stated that no written report was made, that gardeners were not very plentiful, yet they have an interesting society and have developed facts that are useful. He stated that he had developed what might be called a farmer's fruit house, which was proving a success, and also a vinegar generator, which would make perfect vinegar from new cider in from ten to twenty days. Mr. McMaster exhibited drawings and a description of his process. The following is his

PLAN OF FRUIT-PRESERVING HOUSE.

By H. McMASTER, OF LEONARDSBURG.

I made it from a house I put up for a bee-house. It is twenty-five feet square, boarded with barn siding, battened with O. G. molding and painted; inside wall is brick, four inches thick and plastered, filling between with saw dust; space, nine inches.

When changing the house I took out the floor, dug down two feet, took out the stone wall on two sides opposite, extending the dug-out two feet outside from the house. Built up piers, making five divisions, covering from pier to pier with broad stone, two by four feet. When on piers, it is level with the ground; built wall on flat stone to sill.

I use two-inch plank, two by four feet, covering the spaces between the piers, fitting nicely on flat stone against the wall, piers and ground. Planks are used to close coolers. Fruit room I floored on joists, making a space under the floor about eighteen inches. This is used as a cooler under fruit-room, using plank to open and close, to hold the temperature of fruit-room. When the standard is correct in fruit-room, close the coolers under fruit-room with the plank, and cover with saw-dust.

I covered the floor of fruit-room with saw-dust six inches thick, as I approach the sides of the room I increase to a foot, filling up above the stone wall. Inside the fruit-room, I studded and boarded, filling up with saw-dust, making of the three, one wall, twenty-two inches thick. One entrance, no window; double door, which is shut on packing.

In front, I built a house ten feet square, with double wall, filled with saw-dust; one window and one entrance, with door. This is to protect the entrance to fruit-house and work-room. All fruit is graded here.

Over the fruit-room, it is floored. Ice chamber is there, seventeen feet square four high, pitched with hot gas tar. Will put in its place another a year, galvanized iron ice reservoir fifteen feet square. The ice or upper room is protected from the heat by a double and filled wall. Its sides, rafters, and boarded the upper room, filled with chaff, straw, and saw dust, the latter but lightly; space two and a half feet, packed very solid; filling, a little damp.

When the new ice reservoir is completed, will have two and a half feet between the ice and protective wall; two outlets to room, with three doors, each shutting on packing; space between the ice and wall, have four coolers on each side, connecting with fruit-room. In the floor of fruit-room are other opening doors used as coolers.

The coolers are all brought into use to cool the rooms before winter. Commence cooling as soon as fruit is put into the house, always using coolers when it is colder outside than in, and with care to open and shut, as occasion requires. I get the fruit-room to a frosted state before winter arrives. I then close all the coolers connecting with the fruit-room. This house can be made a success without the aid of ice. I can bring it to the proper standard, which is four to six degrees below freezing; and with the aid of coolers under the fruit-room I can hold the desired standard, not varying a degree until warm weather, and then very slow. With the aid of ice, can hold much longer; and if the ice is well protected, it may be held all summer, keeping temperature near freezing point in fruit-house, gathering your fruit, putting it directly under ice, being able to keep all varieties with a very small per cent. of loss.

The ice reservoir is made so as to use a force-pump. When freezing ice in it, cover the space over the coolers with one foot of saw-dust, to prevent fruit-room from becoming too cool.

In May and June, when taking fruit out into the work-room, warmer air will enter fruit-room; open coolers between the two rooms, the warm air will pass to the upper room, the lower room holding its temperature, or near it, by the aid of the ice above.

This plan can be brought to every man's door, costing but little, built in a small way; yet it may be built in the largest forms. This plan of keeping apples retains all their fine quality, ripens the fruit in its most perfect state, tender, brittle, breaking, and juicy, having lost no aroma. Its low temperature, darkness, and confined air, all aid in perfecting the apple to the highest quality attainable, with a *very* small per cent. lost by decay or wilting.

[The Secretary received from Mr. McMaster, on May 11, 1886, specimens of Rome Beauty, Northern Spy, Grimes' Golden, Yellow Belleflower, Jonathan, White Pippin, Baldwin, and some others which had been kept in this fruit house, and they were in excellent condition.]

REPORT OF COLUMBUS HOTICULTURAL SOCIETY FOR 1885.

By J. J. JANNEY, SECRETARY.

In making the report for this Society for the year 1885, we feel called upon to say that, while the year's work has been an improvement over that for many years past, yet the Society has not succeeded in attracting to it as much of the public interest as it should have, and as the members think it deserves. The number of members has increased slowly, but there are a large number of members who are emphatically "silent partners," showing no interest whatever in its existence—not even by a silent attendance upon its meetings; and a fact, which seems a strange one to some of us, is, that we have a large number of citizens, lovers and cultivators of flowers, and gardeners, who seem not to know that our Society has an existence. But, it is presumed, we are but repeating the experience of many others.

All our regular meetings have been held but one, in April, and we have had several special meetings.

Amongst the subjects on which papers were read and addresses made, are the following: "The Proper Winter Care of House Plants;" "On the Cultivation of Flowers and Plants;" "How to Plant a Tree;" "The Circulation of Sap in Plants;" "Noxious and Injurious Plants."

In addition to the papers and addresses, the following topics were discussed: "Care of Lawns;" "Uncommon Shortness of Grass this Summer;" "Currant and Cabbage Worms;" "Strawberries—Varieties and Cultivation;" "Profusion and Brightness of Wild Flowers this Season;" "Tobacco as a Fertilizer," and "A Botanic Garden."

The Society had a strawberry exhibition and festival, at which forty-five different varieties were exhibited. The Society also held two exhibitions of flowers and fruits which were creditable. We also appointed, and had a representative at the New Orleans Exposition.

While the members feel that they have cause for congratulation on progress made, they are by no means satisfied.

President Ohmer.—We have been making an effort to have local societies organized in every county in the State, but somehow or other we have failed. I considered it a part of the duty of the Ad Interim Committee to make an effort to do so, but in their reports they say nothing about new horticultural societies. There is much depending on them to make this Society valuable. If it were not for these societies, you would not have half the people present that you now have. You go into Michigan—the State Society meets four times a year, I believe. I am very anxious about this matter. I know of the good that results from them, and I earnestly desire to have these societies organized. If two or three of you get together with your ladies, and hold a meeting, you can do good. Have a meeting, and hold the form, anyhow. The form is worth something. It is a very important matter. I would like a society especially in this county. I would like to come and meet with them. I have been expecting an invitation, but the invitation doesn't come. I guess they don't want me. They have good material here. All they want is energy. I want you to invite me to one of your meetings. Don't forget it.

The Committee on Business announced the programme for the evening session.

The President then announced the names of the members upon other committees.

President.—It is customary to appoint a committee for the purpose of procuring new members of the Society. President Westwater, H. C. Noble, and G. S. Innis were appointed. Let there be ladies as well as gentlemen. There was a lady asked me to-day, if ladies could become members. The name of Mrs. Carrie Lovejoy was suggested.

Mr. Weltz suggested that the committee be made larger.

President.—The committee can add to their number.

Mr. Weltz.—It wouldn't look very well published in the paper, with so small a committee.

President.—I approve of the suggestion.

The names of Mrs. Lovejoy, Mr. Weltz, Mrs. Fisher and Mrs. Lofland were added to the committee.

The Committee on Membership was then announced, as follows: J. W. Westwater, H. C. Noble, G. S. Innis, Mrs. P. J. Lofland, Mrs. Carrie M. Lovejoy, and Mrs. W. H. Fisher, of Columbus, and Leo Weltz, of Wilmington.

The President then announced the Committee on Fruit: Leo Weltz, of Wilmington; John Post, of Columbus; and N. H. Albaugh, of Tadmor.

Upon motion, the Society then adjourned until half-past seven p.m.

WEDNESDAY EVENING, December 2, 7:30 P.M., 1885.

The meeting was called to order promptly at half past seven, by President Ohmer.

Doctor Townshend, of the State University, gave an address of welcome to the State Horticultural Society, on behalf of the Columbus Horticultural Society, as follows:

Mr. President and Gentlemen of the State Horticultural Society:

The Columbus Horticultural Society has assigned to me the pleasant duty of expressing to you the gratification which its members feel in meeting you again in our good city, and of extending to you all a hearty welcome. I assure you this welcome is not merely a formal matter, for we meet you, not as strangers, but as old friends.

Similarity of tastes and aims have brought the members of your Society together, annually, for many years, and neither personal ambitions nor private interests have been permitted to mar the harmony of your proceedings, and, consequently, we always expect your meetings will be both pleasant and profitable.

I beg to congratulate the members of the State Horticultural Society upon the success which has thus far rewarded their labors. For more than thirty years—first as the Ohio Pomological Society, and later as the State Horticultural Society—you have been diligently at work. Some of us can bear testimony how extensively delicious fruits have been multiplied, and how many homes have been made beautiful since this Society began to exert an influence. A review of what you have already accomplished will, I trust, inspire you with courage to undertake the work still before you. Doubtless, much yet remains to be done. To this, the present meeting will probably direct our attention.

Again, in behalf of the Horticultural Society of this city, I wish to assure the State Horticultural Society of a cordial welcome.

President Ohmer then responded in behalf of the State Society, in the following words:

Mr. President, and Ladies and Gentlemen of the Columbus Horticultural Society:

It affords us, members of the Ohio State Horticultural Society, a great deal of pleasure to be with you this evening, and hear the beautifully expressed words of your welcoming address. I assure you, Mr. President, we all appreciate every word you have just spoken.

This is the first instance in which the Society has held its annual meeting twice in succession in the same place. Your welcome, and entertaining manner of last year was so captivating, that when the fact became known that you desired us to meet here again this year, the desire to accept the invitation was irresistible, and here we are, in full force, to accept the welcome just tendered us. We feel at home here in Columbus, because we know we are welcome, and hope our meeting will be largely attended by citizens of your city.

I have every reason to believe that this will be one of the best meetings ever held by the Society, and you, and your friends, Mr. President, will do much to make it so.

Again, I thank you, in behalf of our association.

President Ohmer then introduced Mayor Walcutt, who welcomed the Society in behalf of the city, as follows:

Mr. President, and Members of the Society:

It gives me great pleasure, as executive officer of the city, to give you welcome to the city. I expected to have been a spectator here, to-night, and to have spent the evening without taking part; but I am glad to assure you of your welcome here, and I hope you will have a pleasant time.

If there is anything in the world I know nothing about, it is horticulture. My day is pretty nearly gone by, and I am not very old, either. My avocation in life has been in a little different channel, but every day, you, gentlemen, are improving in the production of what is pleasing to the eye and agreeable to the taste. I envy you. I envy you the work you are engaged in. Yours is a glorious work. It is a pleasure, and I wish I knew how to do it. I wouldn't know how to grow an apple or a peach or a pear. I don't know whether I would know whether it was good or not, when I tasted it. I envy you your taste and spirit in cultivation. You are laboring for the benefit of your children and children's children and great grandchildren.

I welcome you, and congratulate you upon your advancement in science, and I hope you will have all the enjoyment you want in Columbus; and if there is anything I can do for you, intimate it, and I will do it.

President Ohmer.—General Hurst, of Chillicothe, will respond to the kind welcome of Mayor Walcutt, on behalf of the Society.

General Hurst spoke as follows:

Mr. Mayor, and Citizens of Columbus:

A year ago, we accepted your invitation to hold our annual meeting in Columbus, and our welcome was so warm, so hearty, so earnest, and our entertainment so bountiful, that when we went home we said to ourselves, "If, indeed, it be more blessed to give than to receive, then the people of Columbus must be happy." This year, we

come again to hold our annual meeting here, and we find the same warm words of welcome, and the same welcome of the heart behind these words. What we can say when we go home this time, I cannot imagine.

But, Mr. Mayor, you referred to our avocation, and congratulated us upon the work we are accomplishing. We may well congratulate ourselves, and what you said was undoubtedly true, that the horticulturists of the State of Ohio are engaged in a noble work. It is a work upon which, every morning, when we rise and go to that work, we may ask God's blessing; and when we lie down to rest at night, there, among our trees, and vines, and shrubs, and flowers, and fruits, we can breathe a pure atmosphere and a healthful spirit, and ask God to prosper the work of our hands. It is a noble cause. It is a noble avocation that we are engaged in, and we ought to congratulate ourselves, and be proud that the lines have fallen to us in such pleasant places.

These courtesies that you extend, are very grateful to us. This fraternity of feeling, and this generosity with which we were welcomed last year, and again this year, are a credit to the people of Columbus. These words of kindness, these feelings of brotherhood are to us like the vine climbing against our garden wall, sending out their sweet influences, and making our homes happy and blessed. These evidences of your kindly feeling shall not be lost upon us. We are grateful for them, and will go home with these grateful feelings toward the people of Columbus.

We accept the welcome which you so generously give us, and shall be glad to enjoy this meeting with you.

The President then delivered his annual address, as follows:

Ladies and Gentlemen, Members of the Ohio State Horticultural Society:

The rapidly moving wheels of time have again brought us to our annual meeting. It is just one year to-day, since we had the pleasure of meeting together in this city as the guests of the Columbus Horticultural Society. That meeting was one of the best the Society has ever held in point of attendance, the character of the papers read, and the discussions that followed. It is to be hoped this meeting will likewise be a success in all particulars.

We assemble here to-day, in annual session, to greet one another, to give our experience and doings of the past, and prospect of the coming year.

At our last meeting, we thought it well and proper to enlarge the Add-Interim Committee from five to ten members, thinking by so doing we would get reports from every part of the State, which fact would materially increase the interest of this meeting, and add value to our proceedings. I hope we shall not be disappointed, and that we will get good reports from them all.

In my last annual address, I recommended the propriety of having a summer meeting of this Society, which recommendation was adopted, but for various reasons no summer meeting was held. If you are still of the opinion that a summer meeting is desirable, and may result in good, would it not be advisable to receive invitations from members during this session for said meeting, also to name the time, as well as place. It ought to be, I think, during the berry season, June or July. The Society will please take action on the matter during this meeting.

I need not speak of the Great World's Exposition held in New Orleans, last winter and Spring. As a whole, it was a grand exposition, notwithstanding the many adverse criticisms. The display at Horticultural Hall and surroundings was never equaled on this continent. Our Secretary gives you an excellent but condensed report of said exposition on page 192 of his last report, which most of you have no doubt read.

The meeting of the American Pomological Society, in Grand Rapids, Michigan, last September, was an excellent one. Our Secretary will give you a report of same.

The subject of insect depredation to our fruits, which seems to be on the increase from year to year, and which so often blights the prospective profits of fruit growers, was fully discussed at said meeting by the veteran pomologists of the country. Many new facts were told of the efficacy of certain applications to our trees and berry bushes, and their success with them, which warrant me in calling your attention to the matter, hoping that the subject will be fully discussed at this meeting. I know of nothing that is of greater importance to fruit and vegetable growers than that of the destruction of our insect enemies.

The time has probably come, when we must take up the subject of over-production of fruits, as is the case in some branches of agriculture and manufactures. How best to avoid this, is a question proper to be discussed by you. We have not suffered in

this respect in this State, as have the fruit and vegetable growers of other States, but there is no harm in taking the advantage of their experience. It does not pay to raise a large crop of fruit to be sent to an overstocked market, then to be sold at prices, in some cases, not sufficient to pay freight and commission charges—that which is getting quite common of late.

The organization of new Horticultural Societies is a subject to which I called your attention a year ago. The increase in number of from five to ten members of the Ad-Interim Committee, representative men from all parts of our State, I had reason to believe would take the lead, interest their neighbors on the subject, and, in time, result in the organization of new societies. I did not expect that much could be done the first year, other than probably sow good seed, in good ground, from which, in time, we would gather good fruit. We shall be glad to hear from members on this subject, as we would like to know what progress has been made in that direction.

It is extremely unfortunate that so many of the northern States hold their annual Horticultural meetings the first week in December. Indiana, Michigan, Kansas, Ohio, and perhaps others, hold their meetings that month. A delegation was coming from Kansas to attend our meeting. I received a letter from them about two weeks since, saying they could not come, as their meeting was on the first week, and could not be at both places at once. I, and probably other members of our association, desired to attend meetings of neighboring States, but cannot do so. Some of these States have their time of meeting named in their constitution, and cannot well change. In our State, it is left to the Executive Committee to name the time. In my opinion, the time ought to be named by the Society, at this meeting, or at the meeting held during the State Fair week, when the place of the December meeting is agreed upon. The responsibility would then rest where it properly belongs.

I would further recommend that a special effort be made to interest the young people in the work of our Society. Our present membership is largely composed of men who have passed the meridian of life, and must soon pass away, but we look in vain for the young men who are to take their places. How to accomplish this desirable end, I will leave for you to say.

The admirable arrangement of fruits upon the tables, and the management of the work of committees at the last State Fair, deserve special mention. The attending member of the Board, General S. H. Hurst, to whom is due the credit for enforcing the improved methods, deserves special mention. The effort to have the different entries of fruits placed together, so as to facilitate and enable the committees to better compare the character of the exhibits, and do all parties justice, was attempted on former occasions, but never fully accomplished until ordered by *an old soldier*.

It is quite natural for an exhibitor to desire to have all his fruits together, as had been allowed from the first. I was one of the last to yield to the inevitable. I did so bravely, when I found it *had to be done*.

The halls in which the fruit and floral displays have been made in the past, were poorly adapted for the purpose, and as we are now to have new buildings erected on the new Fair Grounds, I would suggest that a committee be appointed at this meeting to confer with Secretary Chamberlain in getting up plans for Horticultural Hall that will, in all respects, be best adapted for the purpose.

Hoping our meeting here this December will result in important advancement in the interests of Horticulture, and that the Good Lord will continue to shower his blessings upon us, I will close these few words, by thanking you for your kind attention.

Secretary W. I. Chamberlain, of the State Board of Agriculture, then addressed the Society on the subject of

FRUIT STATISTICS.

Mr. President, Ladies and Gentlemen of the State Horticultural Society:

I have always found it easier to pay a note ninety days from now, than it is to pay it now; and so, when your Secretary requested me to open the discussion on "fruit reports," reports on the condition of fruits, with a view of ascertaining the probable supply and demand, it was easy to promise, it was very much like a note of ninety days, and I thought I could pay it. I remembered that I had read a paper on this subject at Grand Rapids, and I thought that if I had done it once, I could do it twice, for the newspaper men got that paper. But the unusual amount of labor connected with the new Fair Grounds, and other extra office work, has prevented my doing so; and so I am without anything written on the subject. But it is said that if you scratch a Tartar skin deep, you will find the Czar there; and so, I suppose you

think that if you scratch me skin deep, you will strike something on the subject of crop reports.

Seven or eight years ago, if you had told me that I would pore willingly over long columns of figures, I should have laughed at the impossibility. If there was anything I used to hate, it was long columns of figures; and the only thing now I like about it is, when we have footed them up, to see how fifteen hundred men reporting from all portions of the State, when we have averaged or summarized their opinions, and thus have their combined opinions, declare exactly the same facts that my eyes disclose to me, when I travel here and there through the State, in regard to the condition of the crops.

Your Secretary is responsible for my appearing before you a body of specialists. For I am not myself a horticultural specialist like the most of you, and therefore doubt my right to speak here, and shall not detain you long. It is true, that on my farm, which I have managed at arm's length for the past six seasons, I have a fine young apple orchard of about fifteen acres, every tree set by my own hand and pruned by it ever since, and just come to splendid bearing. Still I am not an expert or specialist even in pomology. I could not name at sight more than thirty of the three hundred or more varieties; and three of the thirty on my farm yield more than all the rest, and one of the three, more than the other two,—indeed the other twenty-nine, and it would to-day be \$1,000 in my pocket if every tree in the orchard were a Baldwin. And so I am not “up” in nomenclature. The way I got discouraged on nomenclature was this. Some years ago I bought a few new Russian apple trees of a peddler, who was doing a *rushing* business, selling them at \$1.00 a piece, when other trees were 15 cents. He *threw in* the catalogue, and I began the study of the Russian nomenclature, with visions of success. I tried pronouncing them while plowing, as Burns made his poetry; but the horses, like the “Immortal J. N.,” “couldn’t stand the pressure.” They thought, apparently, there was a threshing machine after them, and got fractious and unmanageable. I had to stop the threshing machine or they wouldn’t plow. Then I tried pronouncing the names at table, on the well-known principle that a farmer will treat his wife and family worse than he will his horses! But my aged father settled the business for me by warning me to stop, for I had inherited from my great-grandfather a tendency to lock-jaw! After that I ceased, though I can still pronounce a few Russian names when I have the hay fever—sneeze three times and say pitchouski!

I lay some claim to being a pear specialist, however, and have experimented extensively on pear blight. I had a fine young orchard of standards, but one August while I was here preparing for and helping run the State Fair, the experiment on blight begun. They were a perfect success—the blight was, I mean. It took every tree “at one fell swoop,” and when I next visited the farm after, the Fair in September, I saw a blackened and disheartening mass of leaves, with Golden Bartlett’s and Flemish Beauties set here and there in margins of deep mourning, to show me what I had lost!

I have some knowledge of peaches, having grown two fine crops—of *trees*—but not a peach. What killed them, was the insect known as the *thermometer*, and it killed them all by going down to minus 40°, and “would have gone lower if it had been longer.” That, too, on the very farm where as a child I used to see huge yellow peaches rot by the bushel on the ground for their very superabundance. That was before Horticultural Societies came, and, as the Indiana legislator said, “killed all the peaches with their bugs and yellows and thermometers and learned names.” We can’t raise peaches in Northern Ohio till we get rid of the thermometer pest! Still I count myself a judge of quality and flavor; and have always preferred that fine, luscious variety popularly known as—“peaches and cream”—Jersey cream if you please, ma’am,—rich and thick!

I am not a grape specialist, although I think I “know a good thing in grapes when I see it,” or rather eat it, but I could not, like my friend, your Secretary, give the names of ninety-nine varieties, by taste. I heard, up in Michigan, as a confidential fact, that he could tell ninety-nine varieties of grapes by the taste, blindfolded, and with his hands tied behind his back and standing on his head! I asked him whether it was so or not, and he said that he thought he could tell the ninety-nine varieties, but he was not sure about the position!

No, I am not a specialist in anything, unless it is in the matter of crop reporting. I have a mania for that, from necessity—I mustn’t talk too long. Please call me down, Mr. Chairman, if I do—I will tell you how I got the fever for reporting crops. In 1880 I traveled for about eight or nine weeks, back and forth through many of our great Western States. It was the most magnificent wheat crop that we ever raised,

and it was just in the harvest. I traveled through Ohio, Indiana, Illinois, Missouri, Kansas, Colorado, and back through the Northern States and territories, Wyoming, Dakota, Minnesota, Wisconsin, Iowa, Nebraska and Michigan.

I had seen millions and millions of bushels of wheat standing or in sheaf and shock and stack. The papers in Chicago were reporting the crops, and no official State reports were then made, monthly, except in Illinois, and we had *no reliable reports* of the European crops. The Chicago papers stated that there was very small foreign demand; and the result was that the wheat left the farmers' hands at eighty and ninety cents, and the wheat rapidly rose *after it left the farmers' hands*, until it reached a dollar and thirty-five cents. Into whose pockets, now, did this margin go? Not into the pockets of the men *who produced it*, but into the hands of the speculators that had manipulated the facts as they pleased, and had published to the world that there was an immense crop all over the world, *before it left the farmers' hands*. The very next year the crop report system began in Ohio and in five or six other States, and in May, when it became evident that the crop was going to be a short crop, the Ohio State Board of Agriculture authorized the Secretary to communicate by telegraph with Secretaries of these other States that had begun this work, and publish the facts for the whole country, to the entire country, through the Associated Press. The market rapidly rose with this information, which was confirmed in June and July, and before the farmers were ready to sell a bushel of their wheat, it had come up to the legitimate price, as regulated by the world's supply and demand, (for we had reports from Europe as well, and saw to it that they were published), and thus the producers received the legitimate results of their labors; and the funds thus received went, not into fine houses in the city, but it went into better horses and cattle, better farm implements, better houses and better furniture in the houses, and better school privileges throughout the country, and was thus a substantial addition to the productive capital of agriculture. That same result occurred in 1883, when, as early as April, the Ohio State Board of Agriculture announced a shortage of 80,000,000 to 100,000,000 bushels. The same was true this year, when we announced a probable shortage of 150,000,000 below last year's crop, as early as April, and confirmed the opinion each month until harvest; and an advance resulted before June of nearly 30 per cent. on the March prices. These legitimate advances in price *before the wheat left farmers' hands* had never occurred until after Ohio and other States began to report, five years ago—and Ohio reported not only for the State but for the United States; for the U. S. Department reports had always been so tardy, cautious, conservative, and obscure in meaning, as to have no real influence on the markets. They were usually correct in the *direction*, but not in the *extent* of their prognostications as to overplus or shortage. They were not clear, definite, or positive enough to have much influence on the markets, nor did they give anything like the *extent* of the shortage, until long after the wheat had left the farmers' hands. So, then, this is the way that I came to think there was something worth while in this system of reporting the facts month by month, and that is why I wish I could possibly have had time to put these things on paper beforehand and with care, that they might strike your minds more forcibly.

Now the thing that I have noticed is, that the *fruit and vegetable* crops of the United States are not reported nearly so accurately as the *grain* crops, whereas, from their perishable character, and from the fact that they are not so readily handled, they need to be reported a great deal better. In 1880 and 1881, the Department of Agriculture at Washington, in August, stated that there was 90 per cent. of an average potato crop in the United States; and in September, the Department announced 70 or 75 per cent. of a crop, though every extensive potato grower knew by that time that there was scarcely 33 per cent. of a potato crop in the United States, and within sixty days of that time we were, for the first time, I think, in the history of our country, importing potatoes from Ireland, and they were selling as high as a dollar a bushel in bulk, by the car load, on the track. The same year, I remember that the Department at Washington reported 70 or 75 per cent. of the apple crop of the year before, which was a very large crop, yet, within a few days of the time that report was published, we were paying fifty cents a peck for apples, in Columbus.

Now it is exceedingly important that the fruit growers should be informed of the real condition of the fruit. To illustrate: a day or two before I started for the Pomological meeting at Grand Rapids last fall, I had letters from Portage and Summit counties, saying that buyers were coming in and offering sixty cents a barrel for the choicest winter apples, packed and delivered at the railway stations. I told them that our crop reports indicated less than half a crop for the State of Ohio; that so far as I knew, for the West, the crops were short, and good at the East. The buyers

bought at sixty cents a barrel, large quantities of apples. I started for Grand Rapids, and from the car windows all through Ohio, and all through the fine apple regions of Michigan, I did not see a single locality where a buyer and shipper could get a car-load of apples to ship out. The other day I was in Chicago, and apples were selling in those miserable little barrels, that hold three pecks less than our Ohio apple barrels, at \$2.00 for the commonest apples, and \$2.25 and \$3.00 a barrel for the best. They said they came mainly from New York State. These facts would have been worth something to my friends in Portage and Summit counties, if they had known them. Orchardists ought to know it when there is a large crop in some States and a small one in others, so that they may take the advantage of it in marketing, and not be at the mercy of buyers who know the facts while the orchardists do not; and the same is true for all other fruits and vegetables.

As I have said, I am sure our reports on fruits and vegetables are not so accurate as on ordinary farm crops and stock. What we need, is a corps of special horticultural reporters, especially in the great berry, grape, peach and apple regions along the shore and on the peninsulas and islands of Lake Erie, and in the great berry and apple regions of southern, eastern, and southeastern Ohio.

Now, the thing that this Society can do, to enable the State Board of Agriculture to make more accurate fruit reports, is to give us the names of two or three of the very best horticulturists in every county, who shall be our special reporters on fruits. One thing more, you know a great deal more about than I do. You know better than I, what facts you want to learn from the township assessors in the spring for the Annual Statistics. For example, we now have "total acres in orchard," but not the area of each kind—apples, pears, peaches, etc. Nor have we any information whatsoever as to the area occupied in growing small fruits or fine vegetables, though this is an immense and rapidly increasing branch of industry. In short, both the annual statistics and the monthly reports on horticultural products are far less perfect than on the agricultural. This work of improving them, our State Horticultural Society can help our State Board of Agriculture to accomplish. If your President and Secretary and your Ad Interim Committee will make out a list every month, of the questions you want to ask on horticulture, and help us to the best possible list of horticultural reporters in each county—men who will actually report as well as they can, then I believe that at our office in the State House, with the funds and facilities at our disposal, we can condense those returns and publish them in our reports and through our newspapers, in a form and manner that shall be of service to the fruit growers and fruit and market interests of the State.

Mr. Albaugh.—I believe that this plan is a practical one, and I believe that good could be accomplished through some live horticulturist, one for each county. I believe that one reporter for each county would be able to give sufficiently definite reports or information in regard to this matter, and I believe that a committee could be appointed, and with a little extra expense, probably within the range of our funds, the Secretary might be able to send out these cards, and you could get the information, probably not every month, for you will not need it, but at such times as you will need it, in regard to the fruit crops. There are times in the year, when we want to know what the strawberry crop and the raspberry crop will be, and a good many other kinds of fruit. I believe that this matter ought not to go over, but be taken up now, and the President should appoint a committee, as far as he is able, one for each county, who will be notified to keep his eyes open, so that when the time arrives and the Secretary asks for information, he will be able to give it. I make a motion that a committee of one for each county be appointed, as far as possible, for the purpose of collecting statistics upon the coming crops of fruits.

President.—Why not appoint a committee of two or three now, and let them see to this committee?

Mr. Palmer.—It is said that three heads are better than one, but it seems to me that one man in each county who is posted in horticulture ought to know about what is going on in the county. Statistics have been sent out from Washington, gathered from men who don't know anything about horticulture. You get the right man in the right place, and he can tell you the condition of the county in regard to the fruit crops. One man in every county certainly

ought to report the condition of that county, if he is a man that understands his business.

Mr. Pierce.—It seems to me that there are times when one man cannot be depended on for this information. He may have something to hinder him. The time might come when it would be impossible for him to attend to it. It seems to me that at least two in a county would be better than one.

Mr. Jameson.—I think we would find that what is everybody's business, would be nobody's business. I think that if we had one man in every county, he would know that all depended on him, and better work would be done than if there were several.

Secretary Chamberlain.—We have fifteen or twenty throughout the State now. My idea was, that we have specialists. I think that this Society might well examine our annual reports. The statistics of the assessors, the fruit statistics of our annual reports, which I have tried to improve little by little, are of poor material. They report the number of grapes in the bunch, and then report the amount of wine, and we cannot tell whether they have counted the grape crop once, or part of it twice.

Prof. Lazenby.—I move that a committee of three be appointed by the President to take this matter under advisement, and report upon some plan before the meeting adjourns, whatever seems to them most advisable for the collection and publishing of fruit statistics. It may not be the best that can be done, but it will be a step in the right direction.

Gen. Hurst.—I believe that the Society generally agrees with Mr. Albaugh, in regard to having one man in each county. I would substitute for this motion of Prof. Lazenby's, that a committee of five be appointed to report to this meeting, before its adjournment, a committee-man for each county to report upon horticultural matters. These reports should be monthly. We do not want to know everything about fruits in December, but it would be valuable to know just about how much fruit there is in the State in December. Certain questions of each month that are pertinent to that month, ought to be answered.

After some little further discussion, the question was called for and was unanimously carried.

The committee appointed consisted of Secretary G. W. Campbell, as President of the committee, Mr. N. H. Albaugh, Mr. Matthew Crawford, Mr. Daniel Duer, Mr. Leo Weltz, and Mr. W. W. Farnsworth.

[It was not found practicable to get the committee together during the meeting, and it was proposed that the Secretary confer with the Secretary of the State Board of Agriculture as to the best means for procuring the fruit statistics of the State. This was done, and it was thought best, for the present, at least, for the Secretary of the State Horticultural Society to furnish the Secretary of the State Board a list of competent persons to report upon the condition and prospects of fruit during the year throughout the State, and have these fruit statistics collected and returned to the office of the State Board, in connection with the general Agricultural Crop Report. Secretary Chamberlain has already issued cards and circulars in accordance with the proposed arrangement.—SECRETARY.]

A paper was then read to the Society, by Gen. Hurst, who prefaced it by the following remarks:

I had intended to offer some suggestions to the Society in regard to its future action, when the invitation of the Secretary to prepare a paper for this meeting gave me an opportunity to present these suggestions more fully than I had intended, and so I have briefly and hastily written out what I wanted to say:

PLANNING FOR THE FUTURE.

[Paper read before the State Horticultural Society, December 2, 1885.]

BY GEN. S. H. HURST, OF CHILLICOTHE.

Mr. President:

A year ago, at our annual meeting, we were instructed and entertained by the lecture of Prof. Townsend, on the Botanic Gardens of Europe. In that lecture, we were delighted followers, as he led us through the charming walks and arbor-ways, over the terraces, and among the plats and parterres, where grew the trees and shrubs, and vines, and flowers, and ferns, and mosses of the world's vast flora, and told us of specimens rare and interesting, and bewildering in numbers, gathered by infinite toil from every country and every clime. So that, led by our own Linnaeus, in one short hour we, in thought, at least, visited every land in the wide world, climbing the mountains, scaling their cliffs, and penetrating their gorges, and threading the river valleys as they sweep to the seas, and meandering through the prairies and deserts and tropical forests, feasting our minds on the infinite wealth and wondrous beauty of the forestry, verdure and bloom with which God has enriched and beautified the earth. And you will all remember, when that brief hour was gone, how we still longed to linger in those enchanting gardens and listen to the recital of their rare and varied charms. But our leader could not stay, and so he brought us back to our own land; a land which is in itself a vast Botanic Garden, reaching from the tropics almost to the Arctic zone, blending mountains and foot-hills, and valleys and plains, and prairies and deserts, and rivers and lakes and ocean shores, into one great "National Park," rich as the Nile region, and beautiful as Arcadia. And then, with significant suggestfulness, he said to us, that in this country, so rich in her forestry, and so bountiful in her floral treasures, with the enterprise, the accumulating wealth; with the higher culture, and the intellectual and scientific, and æsthetic tendency of our people, it was evident that ultimately—nay, it was probable that soon, there would be planted in this country a Botanic Garden that should rival, at least, the most noted gardens of the old world. And then, with practical force, he urged that here, at this central city of this great central State—here, under the shadow of our own great University, we might plan and plant this garden—that *now*, with nearly 4,000,000 intelligent people to appreciate and sustain the effort, we might initiate the planting of such a garden—which, in time, would be a charm to the people of our own State, and, indeed, a delight to the whole country. And so we went home from that meeting, dreaming of Botanic Gardens. And all the year, we have been dreaming of trees, and flowers, and vines; of noble avenues and charming trellises; of artistic groups and classified plats, and rare, tropical beauties—wandering, now back to the old world and lingering with deep delight in the splendid gardens there, where more than ten thousand species are named and classified, and then coming home to the garden at Columbus—and walking with pride through that, planting with our own hands, here a tree, and there a shrub or flower, and feeling a deep pride that this is *our* garden. *Still*, it has been all a DREAM. No person has taken the initial step to make it a reality. No Sinton, or Probasco, or Springer has died and left the benefaction of his wealth to bless his people in this great field. And no politician has rushed to the front with a Bill for an appropriation to establish a Botanic Garden. And this Society, with its small numbers and small resources will, perhaps, hesitate to begin a work involving such vast expense and labor. But, because we may not do all we would, we ought not to consent to do nothing. And so, believing there are some things we may do, in this direction at least, I want to invite your attention to a special work that seems to me to be possible and feasible. Our relation to the State Agricultural Society is most intimate. Our annual exhibits are made at the Fairs of that Society, and under the management and direction of its Board. As a Society, we are not recognized, except that usually one member of their Board is chosen by the State Agricultural Convention as a Horticulturist, to look after the interests of the floral and fruit departments. And the management of these departments, under the general supervision of the Board, is assigned to him, aided by other members of this Society. For many years, our Board carried the State Fair around over the State, locating it temporarily at such cities as agreed to give a large bonus. Wearying of this plan of carrying the mountain to Mahomet, the Board have, for a number of years past, held its fairs at the grounds of the Franklin County Agricultural Society. And having invested in these years a large sum of money in improvements on these grounds, which improvements immediately became the property of another Society, our State Board resolved upon

the venture of purchasing and laying out new grounds, which should belong to the State, and of erecting new and permanent buildings. From the first, they were determined, if possible, to make these grounds the finest in all the country. For the past year, these grounds have been in the hands of one of the first landscape gardeners in the State. Its walks and drives and avenues—its trees and shrubs—its lakes and circles are fast giving it the appearance of a splendid park. The grand stand, and the buildings for horses, cattle and swine, are rapidly approaching completion, and are as fine and commodious as could well be desired. Already, the Board have invested in and upon the grounds over \$100,000, and if sustained, as we believe they will be, by the great agricultural interests of the State, they will carry forward the work so well begun, so as to make these grounds and buildings the finest on the Continent. At first, it was in contemplation by the Board to erect one Grand Central Exposition Building, in which all exhibits except those in live stock and in the machinery and power departments, should be placed. But further consideration has inclined them to abandon the idea of a single exposition building, and to erect two or more buildings in addition to Power Hall.

As a single member of the Board, I have no authority, and no thought or right to speak for them, or to say what they may or may not do. But I have the highest confidence in their ability to manage in an admirable manner the trusts reposed in them by the State. I have, however, frankly suggested to them, as I do to you, the fitness of uniting the two departments, the management of which is usually accorded to the representative, and members of this Society, and which naturally belong to us, of blending *Fruit Hall* and *Floral Hall* into one grand Horticultural Temple—a fit temple for Pomona and Flora in this great commonwealth of Ohio. I would have this building ample in proportions for the splendid exhibit which we could almost every year put upon its tables. I would have it modeled with artistic taste, and built of durable material—of brick, and glass, and iron. I would have this hall and its immediate surroundings placed under the care of a competent gardener, who, advising with the botanist of the University, should grow here such rare plants as I tropical trees, and shrubs, and vines, and flowers as might be thought practicable and desirable. I would have the walls of this building covered with vines; its pillars and arches wreathed with luxuriant ivy; its fountains and cascades splendid with ferns and mosses; its niches filled with rarest tropical beauties. I would have Orange, and Lemon, and Palm trees growing up through its fruit tables. All these for a setting, into which each year, the wealth of our orchards, and vineyards, and gardens, and conservatories should be set, making the completed picture—aye! making that Temple of Horticulture a “thing of beauty and a joy forever!” Then, indeed, our Horticultural Hall would be the gem of all that great industrial fair, which each year attracts thousands of visitors from all parts of the country. Then, too, under the care and supervision of a competent gardener, rare cuttings, and bulbs, and seeds could each year be sent out over the State to enrich the private gardens, and conservatories, and vineyards, and beautify the homes of our people.

Again, it has been suggested, that as in three more years Ohio will celebrate her first centennial—the one hundredth year of her earliest settlement—this event shall not be the occasion simply of a local, social centennial celebration at Marietta, but that it be made the occasion of a general recognition by the whole State; that this State Centennial be held here, at the Capital, and take the shape of a grand Industrial Centennial Exposition; that it might fully take the place of the annual State Fair, to be held on the new Fair Grounds, under the auspices of the State Agricultural and Horticultural Societies; that it be made worthy of our great industrial interests; that it be continued twenty or thirty days, giving all the citizens of our State, and multitudes from other States, an opportunity to visit it, and to witness what has been accomplished in one hundred years by the agricultural, horticultural, mechanical, and art industries of the people of this great State of Ohio. Indeed, it seems most opportune, that just as we are planning and building for the permanent and growing exhibits of our great industries, this Centennial invites our recognition, so that we may with confidence appeal to our Legislature and to our people, to come to our help, and to aid us in making these grounds and buildings not only suitable for our ordinary State Fairs, but also suitable for the grand Centennial Exposition of Ohio's industries to be held here in September, 1888. The influence that the members of this society can wield through the press in their several localities—their influence with their Representatives and Senators, inviting liberal appropriations, and the deep interest they may awaken, looking forward to this great event, will largely aid in the accomplishment of the work to be done. And it is to these efforts I invite your thoughtful attention. Your annual appropriation can be doubled or tripled if

needed, to accomplish the additional work suggested. The accomplishment of that work would double your membership, and widen your influence, and largely advance the horticultural interests of the State. Well, I know this is not planting a Botanical Garden. But it is planning a vast and elegant conservatory, filled with rare plants and vines and shrubs. A building which, with its surrounding parterre, could grow hundreds, if not thousands, of rare and beautiful things, and forming a collection which might ultimately become the nucleus of a Garden, and which, in any event, would be a charm and a delight within itself.

In conclusion, allow me to suggest the appointment of a standing Committee of Conference, of which our President and Secretary shall be ex-officio members, which said committee shall consult with the State Board of Agriculture on all matters pertaining to the erection and care of a hall or halls for our future exhibits of fruits and flowers, and co-operate with said Board in procuring the necessary appropriations to carry forward the work of building and improvement.

These suggestions are made, Mr. President, with the hope that in thus planning for the future, we shall give to our Society a new life, and a wider and more potent influence for good.

President Ohmer.—What do you propose to do, and what have you to say upon the subject? It seems visionary, and yet, I think that it could be accomplished. There can be a beginning made. What would you propose, General? What should we do to night, as a Society?

Gen. Hurst.—I suggest that we appoint a committee.

President.—What has that committee to do, now?

President Westwater.—I would suggest that this, which the General has just read, is a subject upon which the people should be advised, and I move that it be published.

Dr. Townshend.—In regard to what has been done in this immediate direction, you remember that a committee was appointed to bring this matter before the Legislature, last year. An appropriation of two or three thousand dollars was asked for, and a memorial was prepared, but no action was taken by the Legislature. I heard a few days since, that the Trustees of the University have taken up the matter and made arrangements for the commencement of such a garden. They are to ask the Legislature for five thousand dollars for that purpose. I think if we have the pleasure of meeting another year, we shall also have the pleasure of seeing this work begun.

Mr. Leo Weltz.—There is no one who would love to see this dream carried out, better than I would. Look back fifteen or twenty years and see how miserably our Fair Grounds then looked. I have not the least doubt that in five years, we shall have these dreams carried out. I have been trying to do a little towards it, too. I have the promise from every Botanical Garden in Europe that they will contribute anything that is in their power. All we have to do is simply to ask, and they will do what they can for us.

Gen. Hurst.—I am delighted to hear from Dr. Townshend that this matter has already taken shape. But I do not see why we should not go forward with the work suggested on the Fair Grounds. They would help each other. That would be our care and pride, and this would be the care and pride of the Society. I think that these things should go forward hand in hand, and this hall that is to be built is to be our home in the future as a Society, at the State Fair. In this hall, that is proposed to be built, we should procure the assistance of some competent gentlemen who have gone about the world and can suggest the best plans. For a thousand dollars a year, a gardener could be kept, and make this, our home, to come back to from year to year, with ever increasing interest and pleasure. I move that there be a standing committee of conference appointed, the President and Secretary being ex-officio members, the committee to consist of five members.

Motion was carried.

President Ohmer.—How is this committee to be appointed?

Answer.—By the chair.

President.—There are two members named in the motion. I will name Gen. S. H. Hurst, Mr. Leo Weltz, and Dr. N. S. Townshend. These gentlemen will consider themselves members of that committee, and will confer at the proper time.

President.—There is a motion following this, that the paper just read by Gen. Hurst be published by the Columbus press; that is, if they desire to do so. Are you ready for the question?

Question was called for, and carried.

Prof. Lazenby then read the following paper to the Society:

THE NEED OF A BOTANIC GARDEN AND ARBORETUM.

BY PROF. W. R. LAZENBY, OF COLUMBUS.

The impression is common that of the three great kingdoms of Nature, the vegetable is really the least important. We know it through some of its more common representatives, but scarcely ever give it the rank that is accorded to either the animal or the mineral kingdom. The truth is, however, it is much more important than either of these, and may be regarded as a connecting link between them. Plant life is not possible without the mineral elements, and animal life is wholly impossible without plants. Did you ever think of the fact that, no animal can exist without the aid of some vegetable production? It is true that animals often live directly upon other animals, but these other animals are dependent for their existence upon plants.

The great office of plants is to change mineral matter; i. e., air, water, and earth, into organic or vegetable matter. The vegetable kingdom, therefore, performs the following offices:

1. It furnishes all the food upon which animals live. All the food of all animals was made by plants.
2. It furnishes pure air for man and the lower forms of animal life.
3. It furnishes all the clothing of man.
4. It furnishes all the fuel and lighting material in the world (natural warmth of the body included).
5. It furnishes the greater part of our utensils, tools, and building material.
6. It furnishes the most valuable medicines for restoring health and warding off disease.

I might extend this list considerably farther, but enough has been said to show that the animal kingdom is not only wholly dependent upon the vegetable for its existence, but for almost every needed comfort and convenience.

So much for the importance of the vegetable kingdom. Let us now consider some special reasons why the Science of Botany, or the study of plants, is one worthy of our attention. These considerations will also include some of the advantages afforded by such study:

1. Representatives of the vegetable kingdom for observation and study are abundant and readily accessible. Weeds, flowers, shrubs, trees, are everywhere about us.
2. The elementary facts regarding the external structure, growth, and classification of plants are so simple that their study can be commenced in early childhood, and be pursued by every one.
3. Botany stands without a rival as a means of developing the powers of observation, and in the scope it offers to the cultivation of the descriptive faculties.
4. The pursuit of botany enlarges our capacity for enjoyment. It opens up to us a world of grace, harmony, and beauty.

5. Most important of all, is the fact that an intimate knowledge of plants has a practical value in various directions. It is indispensable to the intelligent pursuit of horticulture and agriculture, and when we consider that more people are occupied in these avocations than in all others, its value must be recognized. Medicine, both human and veterinary, is depending more and more upon a knowledge and use of plants and their various products. Industrial art and commerce are much more intimately related to the vegetable kingdom than to the animal or mineral.

These brief considerations show conclusively that Botany, or a knowledge of the vegetable kingdom, is of great importance to the welfare and prosperity of the State. Let us forever rid our minds of that superficial prejudice against Botany that ranks

it as a fancy subject—a mere accomplishment, best suited to girls and invalids. Botany is a noble branch of knowledge, and its fundamental principles should be understood by all.

In view of the importance of the vegetable kingdom, and the desirability of increased facilities for studying and observing the same, many have felt that Ohio should have a suitable garden where all plants that would grow in our climate could find a home, and their economic value be definitely determined. This sentiment found expression in the meeting of our State society last winter, and a resolution was unanimously adopted stating that—

“The establishment and maintenance, at the Ohio State University, of a well-equipped Garden and Arboretum, for the illustration of systematic and economic botany and forestry, would be of great benefit to the people of the State, especially to teachers of our public schools, to farmers, nurserymen fruit-growers, florists, and to medical students. In such establishment, the Ohio State Horticultural Society will take the deepest interest, and it desires, respectfully, but earnestly, to commend the subject to the Trustees of the State University, and to the General Assembly.”

Upon the passage of the above resolution, a committee, consisting of Dr. N. S. Townsend, Gov. Hoadly, and Prof. M. C. Read, was appointed to prepare a memorial, expressing the wishes of the State Horticultural Society, and to present the same to the General Assembly of the State. This committee performed its duty in an acceptable manner, and an earnest effort was made to secure the desired end by appropriate legislation. No action was taken by the Legislature, and the matter is just where it was before.

Let us consider the plan contemplated by the Society. The resolution states that the establishment and maintenance of a well equipped Botanic Garden and Arboretum would be of great benefit to the people of the State. What is meant by the “establishment of a Botanic Garden and Arboretum?” The general features of the plan are as follows: It is designed to use a certain tract of land belonging to the State University—say, ten acres, more or less—which is admirably situated for the purpose—for the growth of herbaceous plants, shrubs, and trees, not only from parts of the United States, or of America, but from all other parts of the world, as well. All of the different species and varieties introduced will be grouped under two distinct systems of arrangement. One system will exhibit, in the best manner possible, the natural relationship that exists between the different plants; that is, all the representatives of each family will be grouped together, without reference to their economic properties, and the families, as far as possible, will be arranged according to their botanical sequence. Another system of grouping will place all plants of economic value in groups according to the nature of their products. For example, all plants that produce fibres would constitute one group; all that had any value as medicines would form another, and so on, furnishing a means of popular instruction by object lessons that would be invaluable.

In this way, the climatic adaptations and economic values of plants of all kinds, grasses, grains, fruits, ornamental and forest trees from different parts of the world could be readily studied, and, as a result, reliable information regarding their merits could be given to the public. Such a garden and arboretum could subserve other ends of usefulness. One is the distribution of seeds and plants of new varieties, such distribution usually taking the form of exchange. When we consider that many of our finest ornamental plants come from abroad, that the same is true of vegetable and fruit plants, and remember that no special systematized effort to introduce these has been made until quite recently, this plan of exchange and distribution opens up a wide and promising field of usefulness.

BOTANIC GARDENS IN OTHER COUNTRIES.

Last year, we were favored by a very interesting description of the Botanic Gardens of Great Britain, by Dr. Townshend. There are twelve of these gardens in the British Empire, and some of them have a world-wide reputation. The Garden of Kew, England, is probably the largest and most perfectly equipped of any in the world.

Let us see what other countries are doing in the same direction. Germany has 32 gardens; Italy, 24; France, 22; Austria and Russia, 12 each; Belgium, 6; Switzerland, 5. Our own country, the great United States, has but three; one at Washington, maintained by the Central Government; one at Cambridge, belonging to Harvard University, and one at St. Louis, established and supported by the private

beneficence of Mr. Henry Shaw. Perhaps I should mention in addition a small but well-planned garden at the Michigan Agricultural College at Lansing. The educational value of these gardens is manifest when we consider that a large proportion of them are connected with, or maintained by, educational institutions. Their importance as a means of popular instruction to a very large class of people who have no opportunity for special education is very great, and is recognized by other nations, if not by our own. The relationship that exists between institutions of this character and the culture and refinement of a people is close and intimate. The influence they exert is a powerful factor in the formation of individual character. The character of the individual gives national character, and those nations which possess the strongest character—which lead the world in thought, and in all the higher elements of an advanced civilization, are those which have the largest number of these educating and refining institutions.

Our own State of Ohio is one of the largest and most populous in the Union. No other occupies so important a geographical position; no other has more varied or extensive resources; few, or none, possess greater agricultural or horticultural possibilities. In view of these facts, an accurate knowledge of plants, with special reference to their climatic adaptations and economic value, is demanded. The great State of Ohio should, at least, be on a par with Denmark, Servia, Tasmania, New Zealand, and other countries, each of which has a well-established Botanic Garden and Arboretum. Neither Egypt nor Japan can be classed among the most civilized or enlightened nations of the earth. In fact, they occupy a low plane of civilization, yet they have their botanic gardens. Certainly, Ohio, with her enterprise and wealth, should not consent to take a lower position than these countries.

The rapid removal of the timber which once covered our State, is giving rise to many questions, and presenting problems that demand solution. The only way to grapple with these questions is to make a careful study of forest trees with reference to their influence upon climate, their adaptability to different soils, the best methods of culture, general management, etc. Here, as in other directions, the Botanic Garden and Arboretum should unite the scientific with the practical.

QUESTION OF MAINTENANCE.

This is an all-important subject. It should have a sufficient guaranteed fund, supplying an ample revenue to keep it in good order and to pay for efficient services in the way of investigation and experimentation. Inasmuch as the institution is for the State, it should reasonably look to the State for its support. Another method is by private donation. I cannot but express the hope that the day is not far distant when some wealthy, public-spirited individual will seek to rear a worthy monument to himself, benefit the State, and bless the whole country, by establishing and permanently endowing a Botanic Garden. Surely, some successful business man must see that to thus give his name forever to a grand Botanic Garden and Arboretum would be a most fitting and honorable crowning of a prosperous business career. The names of Arnold, and Shaw, that are now given to such institutions, will be remembered long after the names of Presidents and Senators are forgotten. The State might begin the work by establishing a garden, and then await the coming of some noble, patriotic citizen who would add to the fund's requisite to maintain this—an endowment for a director and trained observers, with all needed appliances for investigation, as well as for the publication of results.

Certainly, no city in the great State of Ohio can claim so many important educational institutions—those representing so wide and varied a range of interests, as Columbus. As the great educational center of the State, the Botanic Garden and Arboretum should be located here. More than this, Columbus is a natural center for testing plants for the whole State. Shrubs and trees grown here will also grow in the slightly colder climate of our northernmost counties. Any location farther south, on account of the warmer climatic conditions, would not be so well suited for the acclimatization of foreign plants. Plants that will stand the climate of Columbus could be safely distributed throughout the entire State.

In conclusion, it is my earnest hope that the general public will so far appreciate the need of a Botanic Garden and Arboretum, that the effort now being made by our Society will meet with substantial financial encouragement from State, city, and private individuals.

Mr. Cushman.—I don't wish to make any lengthened remarks. I am very much interested in this subject. You say you think these men are dreaming

dreams, but I think that I also see a vision, and I hope it may be carried out.

Mr. Palmer.—Mr. Cushman is one of the young men. I am sorry that more of the young men of the State of Ohio do not attend our horticultural meetings and see and learn what we have gone through. I have been in Ohio for sixty-three years. Our young people cannot appreciate what we old men of Ohio have gone through with.

Gen. Hurst.—I don't quite appreciate the compliment of the brother upon us young men. If there are no young men here, I would like to know where they find the boys.

Upon motion, the Society then adjourned until nine o'clock in the morning.

THURSDAY MORNING, December 3, 1885.

The meeting was called to order by the President at nine o'clock.

President Ohmer.—The first thing in order this morning is the announcement of the Committee on Nominations. The committee is as follows:

E. H. Otting, of Medina county; W. W. Farnsworth, of Lucas county; A. F. Newell, of Warren county; W. J. Green, of Franklin county; J. J. Harrison, of Lake county; J. R. Hurst, of Ross county; S. D. Bear, of Montgomery county; B. F. Albaugh, of Miami county; George W. Trowbridge, of Hamilton county.

Then followed a paper by Mr. Devol, of the Experiment Station, on the comparative value of seeds from different sources:

WHERE SHALL WE PURCHASE OUR VEGETABLE SEEDS?

BY W. S. DEVOL, OHIO AGRICULTURAL EXPERIMENT STATION.

Every year, as the time for seeding approaches, the question arises, where shall I procure my vegetable seeds? Many persons have their favorite seedsmen, to whom all their orders for seeds are sent. Others bestow their patronage upon one and then another, changing each year, while still others rely upon their grocer to have in stock a variety of commission seeds from which to select all that they may need for their family gardens. Each may have reasons for his preferences, but very often they are very poor reasons. Of course, such matters as the size of the package, promptness in filling orders, neatness of package, etc., are to be considered in selecting the seedsmen from whom we are to order our supply, but vastly more important is it that the seeds should be true to name, and that they shall grow when planted.

Without discussing the relative merits of the different seedsmen, I will turn to the question, "Is it better to purchase from the seedsmen direct, or from grocery-men and others selling seeds on commission?" If fresh seeds were taken each season from the general stock, the same as those sent direct from the seed-houses, and sent to the commission men, there is no reason why they should not be as good as the seeds they send direct to customers. But they evidently do not collect and destroy all the seeds left at the close of the season's sales. In order to ascertain the comparative vitality of seeds from the two sources, seeds of various kinds were purchased from several grocers in Columbus in the spring of 1884, and their germination tested and compared with tests of seeds of the same kinds procured from the seedsmen. The results showed such a difference in the vitality as to encourage further investigation of the subject. Consequently, last spring a larger number of comparative tests were made. The general results in both instances showed the same thing, viz., that seeds direct from the seedsmen possess greater vitality than those from commission men. Or, in other words, fewer of the seeds from commission men will grow.

Nineteen packages of cabbage seeds, representing three seedsmen, were purchased from grocers. Of these, an average of something over forty per cent. germinated. A hundred and fifty-four packages, representing fourteen seedsmen, were procured direct from the seedsmen. Of these, an average of over seventy-eight per cent. germinated.

Five packages of radish, put up by two seedsmen, were procured from commission merchants, and of these, an average of only twenty-four per cent. germinated. But of thirty-five packages direct from two seedsmen, an average of over sixty-six per cent. sprouted.

Four packages of cauliflower from the commission merchant, put up by three seedsmen, produced an average germination of forty-four per cent. But an average of fifty per cent. germinated, of twenty packages direct from eleven seedsmen.

But compared in this way, we do not get the real differences in germination. This is only obtained by comparing the same variety put up by the same seedsmen and procured from both sources. Taking examples of cabbage seeds, the difference is found to be fully as striking. A package of premium Large Drumhead from the seedsmen gave a germination of eighty-eight per cent.; while the same variety, procured from one commission man, gave seventy per cent., and another from another grocer, only forty-six per cent. of germinated seeds. Of another variety, Improved American Savoy, only twenty-six per cent. of the seed from the grocer germinated, but of those from the seedsmen direct, eighty-six per cent., or over three times as many, grew. A package of Large Late Flat Dutch, direct from the seedsmen, gave a germination of eighty-six per cent. The same variety, put up by the same firm, but sold through commission men, gave only eight per cent. sprouted, a difference of *ten and three-fourths to one* in favor of seeds direct from seedsmen. Other examples might be given, but these are sufficient, I think, to show the inferior vitality of seeds sold by commissioned grocers. I will say further, however, that in these germinations of cabbage seeds, I have not observed a single instance where a variety from commission men gave so large a per cent. of germinated seeds as did the same variety put up by the same firm and procured direct from the firm.

After finishing his paper, Mr. Devol added :

Another loss from the seeds, aside from that stated, would be found in their not being true to name. It is only reasonable to suppose that the seeds sent to commission men are no purer than those they send out directly to customers. From a field test of the latter, it was found in one instance that eighty per cent. of cabbage seeds were not true to name. Computing the loss that would be sustained from one pound of seed at three cents per head on the cabbage grown from that pound that were not true to name, we find the total amount to be \$500. In this instance, the seed was bought for an early sort, and those that came true to name were easily disposed of at a good market price. Those not true to name were either late sorts, or did not heed at all, and could not be disposed of at any price this season. The loss was indeed more than three cents per head, but I take this as a minimum example. Now, if by testing these seeds, we can in any way show the farmers of whom good seeds can be procured, and thus prevent them from purchasing ten pounds of this poor seed less than they would have purchased otherwise, there would be a saving of \$5,000, or the whole cost of the Station for one year.

During the past season we did not test the seeds from the commission men and the seedsmen both in the field, to show the comparative amounts which were true to name, but next season we expect to do that. The Station was not in a condition to do that last year, but we hope next year to continue that work by taking the seeds from commission men and seedsmen and testing them and finding out the actual differences.

A Member.—Does the Experiment Station expect to publish the names of the firms from whom the seeds are procured?

Mr. Devol.—Yes, sir.

President Ohmer.—It seems very strange indeed that the commission men do not have as good seeds as are sent by the seedsmen to their customers. I have no doubt you all feel that it ought to be so. What have you to say upon the matter? Are there any remarks?

Mr. Pierce.—I cannot understand why there should be a difference in this respect. I am personally acquainted with one or two in A. C. Kendel's store in Cleveland. I have been there and bought some of his seeds that are put up

all alike. They do not put up much stock ahead. They are all fresh, and as far as I can see, taken out of the same place. If I go in there and buy a package at retail, it comes out of the same drawer as if I went home and sent for them by mail.

Secretary Campbell.—Mr. Kendel may be an honorable exception to this rule. I think the publication of the names of these seedsmen will have a very good effect.

Mr. Pierce.—Why is there a difference?

Secretary.—Those they send to the commission men are probably old and inferior seeds.

Mr. F. C. Miller.—Had been in the commission seed business for some years. He stated, however, that Landreth & Sons sent around to the commission men and burned up all the old seeds left over in the fall, and gave credit for so many seeds returned. He told of one package of cabbage seed he had bought, that when tried, gave six distinct kinds of cabbage from the one package, and only one was worth cultivating.

Mr. Nichol.—I have been engaged about two years in the seed business, and two or three years ago I was in one of our most prominent seed-houses at the time when their seed-boxes were being returned. There were hundreds of women opening the seed papers and piling up the seeds in piles. They didn't want to save the papers, but they kept the seeds.

Mr. Devol.—I have seen the same thing. The seeds are taken out of the papers and sent out again. We have a law to control the sale of fertilizers in the various States. As much could be saved to the gardeners of the State by a seed control. I do not mean that we want any laws, but that the Station should have it as a part of its work, to test the vitality and purity of the seeds sent out within the State. The Station is doing what it can in that line now. The work of the Station could be assisted by the gardeners of the State, and can be extended. It will soon come into such prominence that the seedsmen will be glad to have their seeds sent there and tested by the Station. It will save the farmers a great amount.

President Ohmer.—Suppose the seedsmen should send seed to be tested and pronounced good, and not send the same seed to commission men and customers at all.

Mr. Devol.—They could not be prevented from doing so; but if seeds were taken from all parts of the State and tested, they would soon learn that we know the quality of the seeds sent out, and if they sent any to be tested, would send the same. The same may be said concerning fertilizers, but gathering them from all parts of the State, no doubt, would go a great ways toward preventing fraud.

Mr. Weltz.—I believe it would be quite impracticable, because the Experiment Station was not established by the State for that purpose. Any one who has garden seeds for sale, can send seeds to the Station to be tested, and get a report that they are good, when only a few of the seeds are good. A man in our county—I could tell his name, but will not—sent a little good corn to the Experiment Station, and received a report that ninety-five per cent. of it grew. This corn which he sent was a little good seed, and all the rest was bad, and he swindled the people, because he advertised, "I have received a report of ninety-five per cent. on my corn," and he sold a great deal of bad corn.

President Ohmer.—When a seedsmen sends out poor seeds, it lasts but a very short time; he is gone up.

Mr. Crawford.—I do not understand that the Experiment Station proposes to send to the seedsmen for seeds to be tested. They get them anywhere and everywhere and test them. Of course, they would send good seeds for that

purpose; but they buy them out of the groceries. Seedsmen can take no advantage of that.

Mr. W. C. Pinkham.—I would ask Mr. Devol if he has tried any corn by the name of Golden Beauty. It was recommended highly as a seed corn. I tested it beside some other varieties. I am growing on excellent soil. I don't like it; it is too soft.

President Ohmer.—We are not discussing the character of corn. It is another question which is before the house now.

Mr. Pinkham.—On the subject of seed, I understand that the Experiment Station is testing seed corn as well as any other. I sent to the Station last spring some seed corn to be tested as to its vitality. They reported a germination of six per cent.; my own test gave one hundred per cent. But what I am getting at is, that I notice that those advertisements of seeds which you find in the papers are not to be relied upon.

Mr. Miller.—I think every grower should have his own experimental station, and test his own seeds before he puts them out. Then he can judge of their vitality.

Mr. E. V. Rhoads.—I think the suggestion by the gentleman of the Station ought to have the approval of the Society.

Vice President Beebe.—Speaking about the germination of seeds, I would like to state that I know of a man, a market gardener, who planted a package of summer squashes. He bought the seed of Ferry & Co., of Detroit. He raised eight different kinds of squashes from that package, the first crop.

President Ohmer.—I suppose Mr. Ferry, like most seedsmen, buys a great deal of stock. They are cheated in the first place, and then cheat their customers. If they would grow what they sell, I question whether that would be the case.

Mr. Miller.—They plant their different varieties too near each other, so that they become mixed.

Mr. Farnsworth.—Ought we to require seedsmen to destroy all their seeds of over one year's age? We are aware that some seeds are just as good the second year. I think many seeds would bear to be returned without loss to the planters, and with great benefit to the seedsmen, if they are not returned too often.

President.—I have no doubt that this is so.

Mr. Palmer.—It is well known that some varieties of seed last for a great while, while others lose their vitality in a year or two. I have known clover seed to be plowed under seven years and then grow.

President.—I do not think that this Society can do much to make a reformation in this case. We cannot spend further time upon this subject.

The President then called for a paper on Floral Decoration of Lawns.

THE FLORAL DECORATION OF LAWNS.

BY L. B. PIERCE, OF TALLMADGE.

At first thought it may seem a little unseasonable in the wintry days of December, when only the frost-bitten skeletons of our summer pets remain to twit our memory of their once glorious beauty, to discuss a subject that can only find fruition in the sun of a coming July, but the very fact that flowers are but temporary; that each returning season we have to plan anew, with the privilege of improving or changing the arrangement, gives floral decoration half its charm, and adds greatly to its value, and even now, in this country, the smoke curls above the crystal roofs of more than 8,000 commercial green houses, keeping up in each one a tiny, tropical summer, that millions of lawns next spring may be again decked with gems of foliage and flowers. We all know how important a part the flowers have played in the old-time garden and door-yard; how our mothers and grand-mothers fussed, and nursed, and fanned

the breath of life into many a slip or root, exchanged or begged from a neighbor, and how gay the summer was made, and how many a weary load was lightened by this almost universal love of women for flowers. The wild garden, as the English call it; the heterogeneous collection of bulbous and tuberous roots, seedlings, annuals, and perennials, so often seen, has doubtless played an effective but unconscious part in the education of many a boy and girl, and in a way that a more formal or studied bed could not have done, but in the closely-shaven, green-carpeted lawns, that are increasing in number each year, the old-fashioned flower bed is obviously out of character, for the reason that it has no distinct character, being simply a medley. These miscellaneous collections still have their use, and I hope the time will never come when there cannot be found in this country a large majority of women who like to fuss with flowers, growing them for their individual beauties and peculiarities, rather than their decorative qualities alone.

It is, however, of the decorative plants, or bedding plants, that I wish to speak, and discuss briefly the principles that it seems to me should guide us in their use.

That the formal, neatly-kept flower or foliage bed, plays an important part in lawn decoration, no observing person can deny. They maintain a bright, showy beauty from the fourth of July, until near the close of September, a period of twelve weeks, which, in favorable seasons, is sometimes lengthened on either end a number of days.

They grow close to the ground, obstructing no view, and, when properly planted and trimmed, form an integral portion of the lawn. They occupy the ground but a single summer, and enable us to substitute, or improve upon, the next year, if we feel disposed. And, lastly, they are within the means of all who are able to maintain a finished lawn, and are the only way in which a large percentage of our population—those who rent—can indulge in practical landscape studies and experience.

By the continued efforts of florists, a large variety of plants, peculiar for their bright foliage, or their beautiful form and free blooming, are now at our disposal, and most wonderful effects, even to portrait painting, are secured by their use.

Although the work of floral decoration of lawns is capable of being greatly aided by following the same common sense rules that guide artists in other lines of decorative work, there has, up to this time, been little use made of any but the time-honored one, the rule of thumb.

We have many thorough, practical florists, but when they have mastered the art of multiplying and growing healthy plants, they consider their part of the work done, and it matters little to them whether their customers plant their flowers in round or square beds. In fact, cases can be imagined, where a conscientious florist, with advanced ideas, in reference to the fitness of forms and plants, might get left with certain kinds of plants unsold, were he anyways squeamish in reference to the use of them. However this may be, the average florist fills the beds as they are cut upon the lawn, or, if the shape is left to him, contents himself with the simplest forms, making the paying ability of his customer gauge the size of the bed.

As for the customers, they follow the fashion; if a five-pointed star, or an attenuated crescent, is the rage, then this is the shape of the figures cut in their lawns, and the size is again graduated to financial resources, tempered by the owners' desire to make a show, which also largely decides the style of flowers, a little, seven-by-nine lawn being frequently decorated with a rank bed of geraniums, or coleus, large enough for a twenty-acre lawn. A marked example of this kind of planting has come under my notice for the last half-dozen years. A large, and well-appointed house, occupied all but sixteen feet in width of a city lot, and the front of the house is about twenty-five feet from the side-walk. The strip of ground at the side is in grass, and, if left mostly unincumbered, would be a very pretty little lawn. The owner, however, thinks different, and has had a five-pointed star cut out near the front, and it is annually planted to five varieties of coleus. The star is fifteen feet in diameter. To add to its undesirableness, the lot is about two feet higher than the side-walk, and the most that passers-by can see is the front side of the different points and angles, without being able to certainly decide what figure is used. There can be but one point of view where this bed can be seen to an advantage, and that is from the chamber window above. Circumstances alter cases, however, and the size of a lawn should not always decide the size of the decorations. I know of a church where two little squares of grass, ten feet across, occupy ground between the church and side-walk. For two years, in each of the squares, was a bed seven feet in diameter. The center, Henry Cannel geraniums; around these was a circle of very dark achyranthus, while the outer border was centaureas. The third year, for some reason, no beds were planted, and the circular places for them was sodded over. At first, I thought the beds were too large, but after their removal, the changed appearance set me to study-

ing upon the matter, and I decided that the original planting was, in this instance, desirable, and in perfect keeping with the surroundings.

The church, sandwiched between closely-built houses, depended upon its imposing architecture and ornamental front, and not upon broad grounds and grouped shrubbery for its effect. The bright and showy, and mathematically accurate flower beds in front of either tower, seemed a part of the general design. Viewed in another light than that of architectural proportion and taste, these flower-beds were doing silent, but constant work for good. School-children and shop-girls, and even hurrying business men and ragged street gamins paused and peered through the iron fence to admire the symmetrical and cultured beauty growing within. Seven days in the week these flower-beds preached sermons upon the use of the beautiful to hundreds who never entered the massive portals of the church beyond.

Flowers may be considered the trimming of a lawn, just as ribbons and flowers are the trimming of garments. Some reference, therefore, to correspondence in color and to the shape and size of the lawn to be planted should seem but natural. The simplest form is where one variety is used in a plain, round, or oval shape.

Of geraniums and coleus alone there are not less than twenty varieties, perhaps thirty, that possess distinctly marked qualities, endurance, and adaptability to form a perfect bed by themselves.

Six geraniums or ten coleus plants will fill a bed two feet in diameter, and the natural growth of the plants six weeks from putting out, if the ground is rich and weather favorable, will increase the size another foot. These plants would cost but fifty cents, which certainly is within the reach of the humblest possessor of a doorway.

In regard to the contour of flower-beds, they should be free from re-entering angles, sharp points and narrow places. I once saw a florist's attempt to make with cut flowers the representation of a two-tined pitchfork for an agricultural festival. The handle did very well, but the tines looked more like the jaws of a cast-iron boot-jack, or the head-rest to a photographer's chair, than a pitchfork. Some wire design artists keep in stock daggers, poignards, and swords. When filled they resemble putty-knives and base ball clubs about as much as anything. The same trouble attaches to points and narrow spaces in flower beds; the plants are too bulky for the design. A thrifty coleus plant in a three-inch pot is not less than four inches across, and increases in size from that on. What folly then to try to make it point a star. I know the design looks pretty when first cut out of the fresh green lawn in May and filled with black earth, and the temptation is great to lay out and make pretty designs, but most of them look better before planting than afterward. To those who like fanciful or geometrical figures, there is an easy way out of the difficulty, and that is to make the star or other design inside of a circular bed. For example, you cut out a circular bed in the lawn, and mark within it a five-pointed star. You plant the star to coleus *Vershafeltii*, and the surrounding space to Golden Bedder. As the plants grow, you clip out wandering or spreading branches of the star points, and allow the ground work to close up around it. The effect is charming, and you do not have to call upon your imagination to complete the points as you would if the golden surrounding was not there.

A crescent may be part of a circular bed, exactly as the new moon appears when it holds the old moon in its arms. If you are very much infatuated after the astronomical craze in flower beds, you can plant a star in the body of the old moon, and surround the whole with a broad band of yellow, and thus have as goodly a show of luminaries upon your lawn as is presented by an express car when decorated with the weather signals of the Signal Service Bureau.

Where a variety of colors and kinds are wanted, I know of no more desirable way than planting them on one or both sides of the path, after the manner of our grandmothers, with a modification. Instead of a single continuous bed, it should be a series of round and oval beds, the narrow diameter of the ovals being the same as the circular ones. A very pretty change is to make the beds octagonal in shape, the smaller beds being perfect octagons, and the alternate ones twice or thrice as long; in other words, alternate squares and parallelograms, with the corners cut off.

In ground defined by long curves of paths or carriage drives, large oval beds on the concave sides seem most appropriate, while in foci of ellipses, or parabolic curves, or abrupt turns and circles, circular beds may be used. In planting beds where intricate designs, monograms, etc., are to be made, there is nothing better than the alternantheras and echeverias, although some of the varieties of *achyranthus* do very well. In fitting the ground it should be thoroughly forked up, and a great abundance of completely rotted manure worked in. In designs like stars, tomatoes,

pin-cushions, leaves, and insects; the centers of each division should be rounded as raised when preparing the bed. This, with due attention afterward to shearing, gives a puffed or quilled appearance that is very effective.

In shearing, as pinching, rank growers like geraniums and coleuses, "a stitch in time saves nine." The beds should be watched, and those shoots that are growing too fast pinched back; the weaker ones will soon come to a level, and the bed will look better than if reduced at once to a uniform surface by the use of the grass hook, which seriously retards growth, and removes blossom buds and bright-colored terminal leaves. In reference to the edges of beds, I prefer to sink them three or four inches below the level of the lawn, and let the spread of the foliage of the plants make close connection with the lawn. The method in vogue at the Dayton Soldiers' Home of having a distinct open V-shaped margin several inches wide upon the outside of the bed, I do not like. There where there is such an immense amount of bed and ribbon planting, and lawn, it is perhaps necessary that there should be no obstacle to the rapid and complete working of the lawn mower, but, nevertheless, it detracts seriously from perfection of appearance, especially in narrow ribbon lines. Of the ribbon mode of using bedding plants, I have said nothing, for the reasons, one of which is that it takes too many plants for ordinary persons to indulge in it, and the other is, that as a general thing, it is no ornament to the lawn. Where there is a defined space, or good back-ground, as when a walk skirts the side of a house, leaving an interval of two or three feet, or where a green-house with sloping bank exposes a long side to the lawn, very pretty ribbon beds can be placed, but the idea of fencing in, or surrounding huge, irregular chunks of lawn with three or four rows of foliage plants is not pleasing, as it entirely isolates the portion surrounded, and destroys its relation to the rest of the place.

We will now leave the realm of bedding plants proper, and consider briefly another way in which we can make use of flowering plants in ornamenting our lawns.

This is by the use of small specimen plants, either of hardy herbaceous species, or of exotics. Of the hardy, herbaceous plants, catalogued by our largest growers, which, in number of species and varieties, count far up in the hundreds, the most noticeable and desirable of all is the *Eulalie Japonica Zebrina*. In four or five years it spreads from a single tuft to two feet in diameter, and grows to six feet in height, bearing a plume-like inflorescence, somewhat similar to the pampas grass. Nearly as desirable is the *Eulalie variegata*, and the *Erianthus Ravenna*, both growing in the same clump-like form. The three, if planted in a group and properly located, would make a noticeable feature in any lawn. Of course, their height would make it best to plant them near the outside of the lawn. Many of the peonies form beautiful specimens, but of all of the fifty or more varieties, *Festiva* is the handsomest. It has a large, pure white flower, with a violet blotch in the center, and grows about two feet high. Next to this is *Humei*. It is three weeks later in bloom than other varieties; it has a dark rose-colored flower, and quickly makes a large clump about three feet high and two wide. It is very suitable for the borders of a lawn, or to stand in the edge of a group of shrubbery, while *Festiva* may be planted close to the house, where every one can admire its magnificent bloom. The only drawback to peonies, and the whole class of herbaceous plants, is their short period of bloom. For this reason I would prefer, where single plants or very small groups are used to go back to the green-house, or tender list. In former years, I have seen for a number of years, at the Northern Ohio Fair, many specimen plants of coleus that measured three feet across, and four and a half feet high, having reached that size by the beginning of September. Of course, ordinary growers cannot do quite as well as that, but the free growing kinds of coleus will reach a very respectable and showy size by the first of August, if grown singly in very rich soil, commencing, of course, with bushy, stocky plants. The holes should be about a foot in diameter, and very thoroughly enriched. The plants should be set out the last week in May, and covered at once with a protecting box a foot square, with a pane of glass for a top. This should remain over the plant for two or three weeks, admitting air every warm day, and throwing an old garment or piece of blanket over the box on cold nights. Twice a week it should have a couple of quarts of manure water, made by putting one-half peck of hen manure in a barrel of water. The leading shoot should be stopped by pinching out a trifle at the top. As the side branches increase in length, they should be bent slightly downwards and fastened by slender stakes, stuck in the ground. This gives them room to develop, and the future treatment consists in slightly pinching the most rampant shoots with a view to symmetry of form. Three such plants, costing twenty or twenty-five cents, planted in triangular shape two feet apart, will make a very fine appearance, and more than pay for all trouble in the pleasure of watching their development and beauty. By procuring 12-inch pots and plunging them in

the garden, filled with very rich soil, nice specimen plants can be grown in seclusion, to be brought out and plunged in the lawn at any time when sufficiently developed. I often wonder why more of this sort of work is not done.

We read in "Arabian Nights," and in fairy tales, of wonderful transformations occurring in a single night, and we read in history of wealthy rulers and owners of large estates who had all improvements made in the night, so that they could walk in the morning amid new scenes and surroundings. Such transformations, in a limited way, are within the reach of the owner of the smallest lawn, if he is willing to devote a few minutes each day to the work. A secluded nook in the garden or back yard, a couple of hot-bed sash for protection in May and June, some rich earth, and a dozen ten or eleven-inch pots are the outfit needed to commence with, and later in the season, some slips can be started to be grown in smaller pots. When nicely grown in August, an early morning's work in the lawn, and a removal of the specimen plants to their new location, will give an entirely new appearance to the lawn, as pleasing and as welcome as a fresh coat of paint to the house, or a new suit of clothes.

For the season of October and November, after frost kills bedding plants, but very little systematic effort is made by the mass of people for the adornment of their lawns; yet in many seasons a little preparation would give quite a show. The *Crysanthemum* has been brought to great perfection, and there are now over two hundred varieties, covering a wide range of shades in color, from nearly black to white, and of all conceivable sizes and forms. They are as readily grown in large pots as geraniums or coleus, and in this shape can be sunk in the lawn, and, by covering during cold spells, or removing to a cool room, be made to brighten the lawn until December 1st. Single specimens exhibited this fall in New York measured over three feet in diameter, and contained hundreds of blossoms.

The pompon dahlias can also be made to do duty as fall ornaments by growing them in large pots sunk in the ground, so they can be lifted and set upon the porch or in the hall during the frosty nights of September and early October.

I will mention but one more plant, and this continues the season about as late as anything. This is the canna, which has been improved until it is nearly as showy as the gladiolus in bloom; besides, it is worth growing for its magnificent foliage and grand massing qualities. For a lawn of one-half acre or more, where a mass of foliage is wanted in a special place, no more striking object can be planted than a group of the larger cannas. They resist ordinary frosts, and flaunt their large leaves in the crisp, autumnal air after coleus, geraniums, and dahlias are black and lifeless. A magnificent group, seven feet high and four or five feet broad, growing in an Akron yard this fall, was perfect as late as November third, when it was cut down in anticipation of a freeze. A single root costs but twenty-five cents, and this will form a group two feet in diameter the first year, if planted on very rich ground. The second year sets enough can be made to fill a bed five feet in diameter. The roots can be kept as easily as those of the dahlia or gladiolus.

President Ohmer.—Are there any remarks upon this paper? Discussion will now follow. Fault has been found with this Society because there is not enough said upon floriculture and ornamental plants. This would be a good time to discuss that question.

Mr. Albaugh.—The subject does not receive as much attention as it should, especially in country homes. I want to say that in my observation, I have found that using a single variety often produces a better effect than where a combination is attempted. I have noticed this more particularly at the railroad grounds at Richmond, Indiana. The Pan-Handle Railroad Company procured florists to decorate their grounds. I think our friend neglected to speak as much as he should about our climbing vines, and of the many handsome, trailing plants. A single plant is often used to great effect in our country homes. Many of our trailing plants are hardy, and can be used from year to year.

President.—This is a wide field. A great deal can be said, and this is the proper time to say it.

Mr. Leo Weltz.—I may state here what they are doing in the old countries in reference to ribbon-bands for the decoration of grounds. The railroad stations, which are mostly established by the governments, are perfect gardens. You find at every station, a place where you can walk about, and you find a

nice garden, with plenty of various kinds of flowers. And they have fruit-gardens, which are attended to by the railroads, because they have so many soldiers that they must employ, and it is necessary to give them some kind of employment. Of course, they can keep their grounds in the very best condition. We always say that Russia is away behind the United States. In some respects it is, but in this respect, it is far ahead of us. They have beautiful decorations and lawns around the railroads. Their stations are splendid. They are almost castles, and they take a great deal of pride in it and build very fine houses. In reference to the decorative plants, I am sorry that I have not time to give you a full description. I saw at a German house a place about three feet square. I never saw anything so pretty in my life. All the three feet was of plants, except a little gravel. It was all before a picture of the Emperor William. There was a monogram of Sedums and other small plants. If we go a little farther into their towns, their little cities as well as their big ones, they have their play grounds and parks for the children. You go there and you find swings for the children and gravel to play in. I was amused to see neatly dressed children playing in the gravel. Oh! I am full of the subject, but I can't get it out.

F. G. Cary.—I am a stranger among you, and I appreciate the subject, a part of which I heard, and only a short part, for I have been out viewing the grounds that are being laid out for our State Fair. I have been delighted, so far as it has been pursued, with the details of the plan for the State Fair of Ohio. You have certainly one of the most magnificent and beautiful spots that I have ever put my eyes upon, with its extensive drives, and its approaches, and the way in which it is laid out. I think it will be a monument to the memory of the gentleman who planned it, as well as something to look upon by the citizens of this State, which will impress them very much in the line that has just been spoken of. Let me say that this has a bearing upon the taste, and refinement, and elevation of country homes, that no one can fully appreciate until they have seen it. Just take, for instance, a single individual in a neighborhood distant from the city, and let him go into the scenes that have been presented by the last gentleman who spoke, and what an influence it has. What a refining influence upon the young, and it is just what is wanted all over this great valley. It is fast coming. I can remember the time when you could scarcely see a flower among the farmers. Now we see beds of them. Now we see ornamentation going on all around us. We find about Cincinnati, such ornamentation as can hardly be found in any western city, because the gentlemen who took the lead of our Horticultural Society there in the early days had impressed upon the people the idea of this ornamentation. I am happy to hear that one of the charter members of the Spring Grove Cemetery is here, and has been walking over these grounds this morning. I admire the stand which has been taken here in regard to this State Fair Ground. Connected, as it is, with the State University, and with the agricultural interests of this country, there is no telling what will be done in the State of Ohio in this direction.

Mr. Miller.—I would like to recommend for climbing vines, three varieties of *Ampelopsis*, the *Variegata*, *Quinquifolia*, and *Veitchii*. I have a large brick building almost covered with the *Veitchii*. He recommended this very highly, and said that he had a great many seeds, and if the members would send to him, he would be glad to distribute them.

Mr. R. H. Warder.—In regard to this *Ampelopsis Veitchii*, I wish to state that it is not hardy in a great many parts of this State. I have had it grow twenty-five or thirty feet high, and then be killed to the ground. Last winter, it was killed. In the greater portion of Ohio, it is not hardy. I should like to make just one remark with reference to something that was said by an earlier

speaker about the beautiful plants of Europe, where they have labor at ten cents a day. I would suggest that he go to Chicago, or Peoria, or Dayton.

President Ohmer.—Let us state this question in regular order. What varieties of ornamental and flowering shrubs have been found most satisfactory for villages lots, and small places? And, what hardy, climbing and flowering plants have been most successful?

Mr. Green.—I think there are a great many here who would like to know what small evergreens are best.

President.—We will come to that by and-by. What hardy, climbing and flowering plants have been most successful? We would like to get some practical results.

Mr. Pierce.—I would like to hear from Mr. Harrison on that subject.

Mr. Harrison.—I think the *Clematis Jackmanii* gives the best satisfaction. There are other varieties that are equally good. There has been much of the *Jackmanii* distributed, and I think, as a whole, it gives the best satisfaction. There are a number of varieties that are hardy with us, and, I presume, would be hardy throughout the State. The Climbing *Hydrangea* has been planted some, but I don't know of it's having blossomed anywhere except in Northern Ohio. I think it will be a very desirable one, for ornamenting buildings. It is not yet very extensively planted, and is quite high-priced. It is proving hardy with us. I think it would be hardy throughout the State. *Ampelopsis Veitchii*, with us, is perfectly hardy. We have seen the *Cissus* climb a short distance. I think it is the most desirable plant for a green-house that we have found.

Secretary Campbell.—I have had some experience with climbing vines, for a good many years. At Delaware, we have a pretty hard climate, the thermometer going as low as any place in Ohio. Last season, we had it thirty-two degrees below zero. I will make only a few brief remarks. In Mr. Pierce's paper, he spoke of the *Peony* as being very short-lived. That is the objection, and it is a great objection. The bloom lasts but a very few days. I think the *Petunia* is a very good substitute. I have seen, at Philadelphia, large masses of double *Petunias*, and, at a little distance, they looked like roses. I remember being at the Shaw Gardens, at St. Louis, and I noticed a great number of *Petunias*. It was a very dry season, and they were almost the only flowers in bloom. I asked Mr. Shaw why they grew so many *Petunias*, and he said, because he wanted flowers, and it was too dry to grow anything else. The climbing plants which I have found most satisfactory, are the various kinds of *Clematis*, the *Jackmanii* and *Flammula*. The *Coccinnea* is a beautiful little thing, and is a favorite. It is like the *Viorna*, except in color of flower. It is bright red, and perfectly hardy. He recommended the *Akebia*, *Ivy*, and *Wistaria*. The climbing *Hydrangea* has grown very successfully, indeed, and seems perfectly hardy, and I am exceedingly pleased with it. I think it will be a very desirable plant. As to the *Ampelopsis Veitchii*, I have heard of its being injured, in some places, but it stood in Delaware last winter, to my surprise, and is very handsome this season. I have heard of some young plants being killed down to the ground, and sprouting up afterward. I think, however, as a general thing, it is quite hardy. Another plant that is very handsome for the lawn is the *Yucca*. The *Day Lily* is another plant that is quite desirable.

Mr. Trowbridge recommends *Philadelphus Grandiflora*, *Coronaria*, and *Gordoniana*, *Weigela rosea*, *Xanthocerus Sorbifolia*, *Ceanothus Glorie de St. Julien*, and *Hydrangea Paniculata Grandiflora*.

Mr. Harrison.—I would like to make an explanation in regard to the Climbing *Hydrangea*. There are two varieties. The first is called *Schizogophragma*. The one I speak of, is called *Scandens*. The *Scandens* has a larger leaf, and is much more inclined to climb.

Mr. Albaugh.—I should like to say something in favor of the *Wistaria Magnifica*. It blooms twice a year. It is not a climber, but a winder. It does not injure the wall of the house, and is exceedingly rapid of growth, and beautiful. You can easily keep it trained, and it will take a neat and shapely form of itself. It makes a very desirable plant, and is perfectly hardy. I would like to speak of another thing. I have found that there are nooks and corners that can be utilized by one of the most beautiful flowers, that is, the Pansy. It appears to me, I get more satisfaction out of the Pansy than any flower I know of. I think we do not give enough attention to the climbing roses. I should like to ask Mr. Harsison what are the *hardy*, climbing roses? The *Prairie Queen*, with me, is not hardy. For the last three winters, it has been killed to the ground. Previous to that, we had a *Prairie Queen* that climbed about the house, and covered one whole side. I think that we had more than a thousand blooms, full blown, on that one vine, but the winter of 1880-'81, killed it to the ground. The check was so great, that it did not recover entirely, until last winter killed it again. I wish I could find something as beautiful as this, that is perfectly hardy.

Mr. Crawford.—I have in mind a vine that has done more to beautify buildings in Ohio, from the log cabin to the church, than any other. I refer to the *Virginia Creeper*.

Mr. Albaugh.—I should like to ask whether the *Hydrangea* grows up every season from the root; and whether it blooms on old or new wood?

Mr. Harrison.—We have only had it in flower one season. I think it was from the old wood. In reference to the hardy, climbing roses, I do not know that I can give any information. I supposed *Prairie Queen* as hardy as any. We never had it injured. *Baltimore Belle* is a beautiful rose, but I do not know that it is any hardier. I think *Prairie Queen* as hardy as any.

Secretary Campbell.—At Delaware, we have always considered that, when trained upon walls of buildings, both *Prairie Queen* and *Baltimore Belle* were quite hardy. I do not remember that they have ever been killed.

Mr. Warder.—There is a vast difference between the climate of the Lake Shore, and that of Central Ohio. He recommends the *Clematis graveolens*, the common Bitter-Sweet, very highly, and also the Trumpet Creeper. Of the latter, he says that it can be cut back, and made to throw out lateral branches, and a series of blooms. It is one of the most ornamental plants, although it is a weed, when it gets possession of the soil.

Information is asked for in regard to the *Magnolias*.

Mr. Harrison says that the *Magnolia* is hardy, and its flowers are very fragrant. He speaks of the varieties *Soulangeana* and *Kirtland* in the highest terms. They are hardy, and have never been injured in their severest winters. The *Tripetala* is not quite so hardy, but has never been injured at Painesville. It has large blossoms, and is very desirable. The *Glauca* is also hardy.

A Member.—Does it bloom more than once a year?

Mr. Harrison.—No, sir; not that I know of. There is our common *Cucumber Tree*. It is a grand leaf plant, if you have room for it.

Mr. Moore.—I have been watching the *Glauca*, and some other *Magnolias*, for quite a while. The *Glauca* blossomed with us twice last season, in June and in August. Little plants, not over two feet high, had four to six flowers, very fragrant, and very much sought after; and I thought that if it were hardy, it would be a very desirable plant for small places, outside of the sulphur and coal smoke. My friend, Mr. Beebe, says that his blossoms regularly, twice a year.

Mr. Poste.—I have had considerable experience with *Magnolias* here, in Central Ohio. *Speciosa* does tolerably well. We hardly know of one killed

by the severe winter. Nearly all the Magnolias in Columbus went through last winter without killing, and blossomed. It may be killed back, but the root of the Magnolia is not killed, and it will come up and replace itself. It is generally, only about one winter in ten, that they are injured. In speaking of the *Speciosa* blossoming in the fall, it is quite a common thing with me. The Magnolia, a great many suppose, from its connection with the South, would be a very tender tree. It has gone through the winter with us much better than many others. As to the manner in which it blossoms, the bloom-buds are formed at the very ends of the shoots, and every blossom you will have in May, is there now, but the bloom goes through the winter in its immature state. There is a great amount of vitality in the Magnolia, accounted for in its pithy, large-grained wood, and freezing does not rupture the cells. The *Acuminata* is a splendid variety.

Mr. Pierce.—My own experience with the *Glaucia* is, that it is not entirely hardy, when young. It was quite a number of years before I could get one to grow more than a year. Some one told me to protect it for a few years with straw. I did so, and succeeded in growing one.

Mr. Poste.—I have had the same experience with the *Glaucia*. It is tender in this respect. It does winter-kill. It grows in the summer, and dies back in the winter, and then reproduces itself. The principal thing in raising Magnolias is to mulch them, winter protect them, either with leaves or straw.

Mr. Pentland.—I want to ask the gentleman if the *Glaucia* and *Conspicua* are identical.

Mr. Poste.—Not identical, but alike in character.

President Ohmer.—They are similar; but the *Conspicua* is Chinese; the *Glaucia*, American.

Mr. Cushman.—Is there any Magnolia known to the trade as *Magnolia Microphylla*? Does it resemble the one on the grounds of Jos. Perkins, at Cleveland? He has one called the *Microphylla Magnolia*, and it certainly is a beautiful flower, resembling a house-plant lily very much, only it is so much larger. I think it is the finest thing I ever saw in bloom.

President Ohmer.—Gentlemen, we have talked long enough upon this subject. Let us take up the next question—Arbor Day. How can we get the teachers and scholars of our public schools interested in it? I will tell you what we did on Arbor-Day, last year. I got a letter from Dr. Warder, telling me to have the Township Committee see to it that Arbor-Day was kept for the planting of trees; to publish it in the papers, and have the people plant trees. The schools were dismissed. In came the wagon loads of trees. The schools turned out, with recitations and speeches and dedications of the trees. We planted over two hundred trees, principally ash, poplar, and chestnut. In consequence, we have got about two hundred trees. We needed trees in our Fair Grounds, and we planted them there. We are going to plant them at our school-house next year. Are there any other remarks? We will take up at the same time the question, which are the best trees for road side planting, and what distance apart should they be planted? I have probably as handsome a row of maple trees along the road in front of my farm, as you ever saw. The row is fully half a mile long. They are beauties. I have a nice side-walk. I appreciate them, and others appreciate them; and to give you an idea of how they are appreciated, some three or four years ago, when tramps were plenty, five or more of them passing in front of my place, were trudging along in the hot sun, and when they saw the trees and the walk, they pulled off their hats, and one said, "God bless the man that planted these trees." I happened to be within hearing, but out of sight. I do not favor planting the trees as near together as mine are. They are thirty feet apart. I would not favor planting

trees along a public road less than fifty feet apart, and sixty feet would perhaps be better than fifty. You do not want to shade the road, for if you do, you will have a muddy road. Fifty feet is not too far apart. Instead of making it less, I would make it farther, but I would say, plant along all the roads.

Mr. Moore.—You didn't tell us what kind of maples they were. Were they red or white?

President.—Red and yellow; the ordinary soft, water maple. They are strong and quick growers. The sugar-maple is a slow grower.

Mr. Trowbridge.—I would say, don't plant them on the south side of a road running east and west, for the reason that it keeps the sun from shining on the road and drying it out. It requires a great amount of labor and material to keep such roads in repair. He would recommend planting upright growing trees, such as the Linden.

Mr. R. H. Warder.—Planting on the south side of the road keeps the sun off, so that the road does not break up with every little break in the spring. In this case, the shade on the south side would be valuable. He recommends *Catalpa Speciosa* for road-side planting. He would plant oaks and willows together, alternately, thirty feet apart. When the oaks are large enough, take out the willows. He does the same with ash and oak. It produces an immediate effect, and trees are cheap. I think that all we want to encourage this road side planting and ornamentation is to direct the attention of the people to it, to see how much can be done with a little labor and very little expense.

President Ohmer.—I planted a tree in memory of your father, and it is growing on my place. At the same time I took a tree to the school-house, near by. The scholars and teacher helped to plant it to the memory of President Garfield.

Mr. Warder.—I think that children will take much more interest in, and be much more careful of all other trees, by interesting them in the way of planting for some purpose like that.

President.—In the planting of the Garfield tree, out of eighty scholars and three teachers, all had something to do about planting that tree, so that it is our tree.

Mr. Albaugh.—I have a neighbor whose farm lies next to mine, with only a line between us. In the fence corners we planted Rock sugar-maples. Between the maples were native evergreens, in the alternate fence corners. That fence-row is a thing of beauty. It is a wind-break, a shelter, and a place of resort for the birds.

President Ohmer then announced from the question box: Would it be safe to plant young trees in an orchard that had been planted a number of years, and where part of the trees had died?

Mr. Trowbridge.—He ought not to put in the same kind of trees that had died out. If an apple tree died, put in a peach tree, and it will be more likely to make a success.

Mr. Harrison recommended removing a portion of the old soil and putting in new soil before planting.

Mr. Pentland.—Plow up the soil, and cultivate in corn.

Mr. Palmer.—There is not one man in ten who will plant a young tree in an old orchard, and take proper care of it. I have seen a good many old orchards dying out, and he had better plant a new one.

Mr. McMaster tells of planting an osage-orange hedge on some waste creek bottom land, which was allowed to grow up wild. From the hedge he has cut many good fence-posts. The timber has proved to be valuable, and so far as he can see, very durable. He thinks it possible that the osage-orange may prove very useful for utilizing waste lands in this way.

Mr. Farnsworth states that he has had a limited experience with hedges, but that he has a hedge six years old that in two more years will furnish good fence posts.

The Secretary then announced a telegram from the Indiana State Horticultural Society, in answer to the greeting sent from this Society, as follows:

"The Indiana Horticultural Society, now in session at Lafayette, Indiana, sends greeting to the Ohio Horticultural Society.

"SYLVESTER JOHNSON, *President.*"

Upon motion, the Society then adjourned until two o'clock P. M.

AFTERNOON SESSION.

Thursday Afternoon, December 3, 1885.

The meeting was called to order by President Ohmer promptly at two o'clock.

The first thing in order being the election of officers for the ensuing year, the report of the Nominating Committee was presented, as follows:

To the Ohio State Horticultural Society:

Your Committee on Nominations respectfully present the following report of nominations for this Society:

President—N. OHMER, Dayton.

Vice-President—H. Y. BEEBE, Ravenna.

Secretary—GEO. W. CAMPBELL, Delaware.

Treasurer—J. J. HARRISON, Painesville.

Ad Interim Committee—R. H. Warder, North Bend, Hamilton county.

A. F. Newell, Warren, Trumbull county.

Gen. S. H. Hurst, Ghillicothe, Ross county.

Matthew Crawford, Cuyahoga Falls, Summit county.

W. W. Farnsworth, Waterville, Lucas county.

Prof. W. J. Green, Columbus, Franklin county.

E. H. Cushman, Euclid, Cuyahoga county.

F. R. Palmer, Mansfield, Richland county.

Leo Weltz, Wilmington, Clinton county.

N. H. Albaugh, Tadmor, Montgomery county.

Your committee would recommend that the present Standing Committee on Nomenclature be retained, with the addition of Daniel Duer, Millersburg, Holmes county.

E. H. OTTING,
W. W. FARNSWORTH.

A. F. NEWELL,
W. J. GREEN,

J. J. HARRISON,
J. R. HURST,

S. D. BEAR,
B. F. ALBAUGH,

GEO. W. TROWBRIDGE.

Nominating Committee.

On motion, the report of the committee was adopted, and the ballot of the Society being cast for the officers nominated, they were declared unanimously elected.

The next thing in order was the report of the committee appointed to visit the grape regions of Lancaster county, by Mr. F. R. Palmer.

REPORT OF COMMITTEE ON VINEYARDS AND FRUIT CULTURE IN SOUTHERN OHIO.

BY F. R. PALMER, OF MANSFIELD.

Mr. President:

Your committee appointed at the annual meeting in September, to whom was referred the responsibility of investigating the conditions of soil, mode of culture, pruning, etc., resulting in successful grape culture in the vicinity of Lancaster, Ohio, beg leave to submit the following report:

And now, Mr. President and gentlemen of the Ohio State Horticultural Society, in submitting this report, your committee solicit your kind consideration, knowing that a satisfactory solution of the difficult question referred to us, is no light task. We may suppose that fungoids, mildew, and rot originate in one common cause, but just what that cause may be, is difficult to ascertain. We may understand the cause of some forms of fungus, and by proper mode of culture, pruning, etc., guard against them. But the question as to just what produces grape-rot, so destructive in our vineyards, is one more easily asked than answered; especially in a report like this, where there is no time to enter into details.

If you should ask a boy ten years old the reason why grapes rot, he would tell you without hesitation that it is "just because," but if you would ask Dr. Townsend or Prof. Lazenby, it would take them a much longer time to render a satisfactory explanation.

Please allow me first to say, that we do not claim to have discovered the primitive cause of grape-rot, or its certain preventive. Yet we may refer to some of the conditions under which it is most destructive. We know that fungus, mildew, and rot work death and ruin in our vineyards in many localities in Ohio. We may know their nature, and under what conditions they grow and develop most rapidly; yet in many localities in Ohio we are utterly powerless to prevent them. These fungi develop most rapidly in low, flat lands, and under the influence of excessive heat and moisture; hence, these unfavorable locations should be avoided.

Our observations in the inspection of vineyards in the vicinity of Lancaster and elsewhere have convinced us that elevated sites, where there is always a current of warm air during the night, which prevents a heavy deposit of dew and drives away fog, is the only safe place for vineyards, so long as rot prevails.

The most successful vineyards in the vicinity of Lancaster are situated about five hundred feet above the "Hockhocking" Valley, only a few miles distant, and 1,375 feet above the level of the ocean. We first visited a vineyard of seventy-five acres, belonging to Mr. J. S. Snider, fifty acres of which were in full bearing. This vineyard is about three miles from Lancaster, and its greatest elevation 550 feet above the city. A part of this vineyard is on the summit, but a great share of it on the hill-sides, and sloping in almost every direction.

The vines are planted in crooked rows along hill-sides, conforming to the shape of the ground. This vineyard is trained to single stakes, and the "renewal" system of pruning adopted. Cutting away the old wood to within about two feet of the ground, and allowing two or three canes to grow every year for fruiting the next season. This vineyard was bearing a fine crop of grapes, averaging about ten pounds to the vine, all entirely free from any blight, mildew, or rot, and the fruit of excellent quality.

The principal varieties grown by Mr. Snider are Ives Seedling, Concord, Elvira, and two varieties of white grapes, introduced from Missouri—the Missouri Riesling and Grein's Golden. The Riesling is a compact cluster of a light green color (not ripe at the time of our visit, September 15th). Grein's Golden is larger in bunch and berry, a little earlier, and, I think, when quite ripe, a good table grape. Both are white grapes, appear to be entirely hardy, of vigorous and healthy growth, and very productive. We also noticed a few vines of Delaware, Lady, Rogers' Hybrids, and other varieties, all showing fine specimens of fruit, entirely free from any disease.

The natural growth of timber on these hills is Chestnut, Chestnut Oak, Pitch Pine, Persimmon trees, Wild Fox Grape Vines, and Huckleberry bushes. Much of the land in Mr. Snider's vineyard is too poor to grow white beans. Yet it appears to be naturally adapted to fruit-growing.

We noticed a Persimmon tree on Mr. Snider's place, bending under ten or twelve bushels of fruit. On some farms were fine crops of plums, and to our surprise, we saw Peach trees in the city of Lancaster, bearing nice specimens of fruit within one hundred feet of where the thermometer registered 28° below zero last winter.

And Mr. Snider is so successful in grape-growing that the crop on fifty acres is

annually worth more money than the grain crops on any five hundred acres of the best land in the county.

The surface soil on these hills is a mixture of clay and sand, and considerable shelly sandstone, comprising a large per cent. of iron. The sub-soil is sand rock, mixed with conglomerate salt rock and silicate of iron, samples of which I picked up in the vineyard, and they are here for your inspection. Mr. Snider showed us one place on the summit of the hill that was too poor to grow weeds, and said that after a heavy rain, which softened the ground, he took a strong team and plow, and an extra hand to hold the plow down, and plowed it cross-wise, first one way and then the other, in order to scratch up enough loose dirt to cover the roots of his grape-vines when he planted them. (Mr. Snider is present, and if I make any mis-statement I will thank him to correct me.) Yet, notwithstanding the condition of the soil on this "knob," I think the grape-vines were fully as productive, and the quality of the fruit equal to that of any other part of the vineyard.

Indeed, our observations in this successful grape-growing district convinced us that the proper selection of a suitable site for a vineyard is much more essential to success than the quality of the soil.

When I saw the immense crops of fine, healthy grapes on these "vine-clad hills," and noted the apparent lack of fertility in the soil, it reminded me of a little anecdote related by a friend of mine, after visiting Florida, last winter. He said, while rustivating in a rural district, he "ran across" a native "sand-hiller," a long, lank, cadaverous-looking fellow. It was January, yet his summer hat looked as if it had seen some service. His pants were very short on top, and failed to meet his stockings at the other end by about two inches, yet he was somewhat of a genius. In conversation with this man my friend put this question, "My dear sir, what is land worth an acre here in Florida?" "Well, stranger," said the man, "to be honest about it, the land ain't worth nothin', but the climate is worth a hundred dollars an acre." Now, this remark applies with almost equal force to the elevated portions of Fairfield county, when grape-growing is the consideration. Here grapes escape fungus, mildew, and rot, all of which are produced by unfavorable climatic influences over which we have no control, and not from any defect in the soil. This is the secret of the "vine-clad hills" of Germany and other grape-growing districts; these elevated lands being comparatively free from heavy dews and excessive moisture, which, when warmed up by the morning sun, produce mildew and rot, and ruin our grape crops. In proof of the accuracy of this theory, I will say that your committee visited a vineyard belonging to Mr. F. J. Boving, two miles south-west of Lancaster. The site is elevated but little above the Hocking river, two miles distant. The quality of the soil for general farm crops is much better than the elevated and hilly portions of the county, yet the grapes in this vineyard were so damaged by mildew and rot as to render them unfit for market; the varieties the same as those in the successful vineyards. Another vineyard, belonging to Mr. Martin, on an elevation of perhaps four hundred feet, was well loaded with fruit of good quality, bearing from twelve to fifteen pounds to the vine. This vineyard is principally on hill-sides. The soil is similar to that of Mr. Snider's vineyard, and that of the State Farm.

The principal varieties grown, are Ives' Seedling, Concord, and Elvira. This vineyard is trained to single stakes. Mr. Martin's mode of pruning is somewhat different from that adopted by Mr. Snider; he leaves more bearing-wood, and has at least one-fourth more fruit to the vine, yet the bunches were large and fruit entirely free from any disease.

Your committee had frequently heard of the Van Burton vineyard, and had seen the fruit at the Ohio State Fair; hence we had some curiosity to see the mode of culture, pruning, etc.

We found the vineyard four miles west of Lancaster.

The elevation is not so great as that of the State Farm, or Mr. Snider's vineyard. The soil is more fertile, yet similar to that of the more elevated sites. But what surprised us most was, that Mr. Van Burton does not cultivate his vineyard; yet nowhere else did we find so large bunches of Concord and Ives' Seedling. This vineyard was sown to clover and timothy six years ago. The grass is cut at the proper time to make hay, and at the time of our visit (September 15th) the vineyard was a nice, smooth lawn, and the fruit free from any defect. A part of the vineyard is on wire trellis, the balance tied to stakes. Many of the vines on trellis were bearing from thirty to forty pounds of grapes; those on stakes, an average of fifteen pounds. The quality of the fruit was not so good as in other vineyards, partly (as we suppose) for want of cultivation, and partly the result of over-bearing.

Our experience in grape-growing has convinced us that where quality of fruit is a

consideration, fifteen pounds is all that a vine should be allowed to bear when trained to a stake, and that twenty pounds should be the limit where vines are trellised.

We also believe that a rather thin soil, with thorough and clean culture, will produce grapes of the best quality.

Messrs. Van Burton and Snider were the only exhibitors of grapes at the Fairfield county fair. Mr. Van Burton's grapes showed up the best bunches on the table; but Mr. Snider took first premium on most entries. I suppose the judges were governed by quality rather than appearance.

The State Farm, or Ohio Reform School, is situated six miles south of Lancaster, on an elevation of nearly six hundred feet above the city. Here we saw much to interest us. Mr. C. D. Smith, the very gentlemanly superintendent of the horticultural department of the farm, made our visit exceedingly interesting, pleasant, and profitable. The natural growth of timber and the general character of the soil is similar to that described on Mr. Snider's place; the loose sandstone on the surface comprising a considerable per cent. of iron. There are twenty acres of vineyard on the farm. The vines are trained to stakes, and allowed to bear twelve to fifteen pounds each.

The principal varieties grown are Concord, Ives' Seedling, Elvira, and Missouri Riesling; and when we looked upon those hillsides, apparently too poor to grow weeds, it certainly was astonishing to see the magnificent crop of grapes in the vineyards. Mr. Smith gives thorough and clean culture, and his success is truly surprising.

The vineyards on the State Farm are from ten to twenty years old, and have never received any manure, with the exception of one vineyard of three acres of Concord. On this they put four hundred pounds of pure bone dust per acre, five years ago; since that, the crop has been larger, and of better quality. Mr. Smith regards bone dust, two parts, and muriate of potash, one part, as a complete fertilizer for the grape.

November is considered the best time to prune. Mr. Smith had experimented by pruning some in mild weather in mid-winter, and also in early spring. The result was, that the vines pruned in mid-winter, killed back two or three buds, while those pruned in November and early spring were uninjured.

The Concord is the leading variety grown for table use and for wine purposes. Missouri Riesling, Elvira, and Ives' Seedling, are valued in the order named.

The demand appears to be for white wines, hence the Riesling and Elvira sell for double the price of Ives. We noticed that warm rains about the time of ripening, bursted the Elvira very badly, destroying fully one-fourth of the crop; hence the Riesling is the most popular wine grape. As "table grapes," we could see nothing in the quality of either the Missouri Riesling, Elvira, or Ives, to recommend them to public favor, while we have so many varieties of much better quality. As "white" grapes for table use, we esteem the Empire State, Niagara, Pocklington, Lady, and Martha, as preferable to the Missouri seedlings.

It is claimed that the Missouri Riesling, Elvira, and Grein's Golden, are especially exempt from fungus, mildew and rot. If, after sufficient trial, they sustain that reputation in other localities, they will be valuable so long as better varieties fail. It is to be hoped, however, that the old adage, "Every dog has his day, and sooner or later passes away," may prove true in reference to grape rot.

The managers of the State Farm, or Ohio Reform School, have wisely appropriated considerable land and labor to fruit growing, the locality being well adapted to this branch of industry. Apples, pears, and small fruits are grown to some extent. The apple orchards, however, in common with those of other parts of the State, were not bearing a full crop this year. The pear trees were loaded with fruit of very fine quality. Mr. Smith referred us to a row of twenty-five Seckel pear trees, loaded with very fine specimens of fruit. The trees were very uniform in size and symmetry, and the foliage as green as in June. These trees are twenty-five years old. There are two vacancies in the row, both blighted in ten days time, two years ago. There is also a young pear orchard, of one hundred and fifty trees, comprising ten varieties. This is an experimental orchard, the result of which we will hear in due time. Mr. Smith is just the right man, in the right place, to make experiments of this kind, and report the results.

A Strawberry patch of about two acres is well cared for. The yield this year was one hundred and ten bushels per acre. The varieties grown are Sharpless, Charles, Downing, Crescent Seedling, Forest Rose, Glendale, Wilson, and Kentucky. Forest

Rose appears to succeed on a sandy loam at Lancaster, but unfortunately doesn't know how to behave away from home.

Mr. Smith also referred us to a Raspberry patch of a few acres, principally Turner, Cuthbert, and Gregg. The red varieties are grown in rows, six feet apart, and in hills three feet apart in the row. They are not allowed to "sucker" much, but kept in hills, five or six canes in a hill. When the growing cane is two feet high, the top is nipped off, as recommended for Black Caps, and laterals allowed to grow at will during the balance of the season. In the spring, the laterals are cut back to within eight or ten inches of the main cane.

The plow and cultivator are freely used between the rows, and all weeds and grass hoed out. This hoeing is done by the two hundred boys which Mr. Smith has under his supervision. With this mode of culture, the Turner produced one hundred bushels per acre this year.

The yield of Cuthbert was not quite so large, but the advanced price at which they sold, made the value of the crop about equal. Mr. Smith regards a liberal application of manure as essential to the production of large crops of strawberries and raspberries; especially does this apply to the Gregg raspberry, on their thin soil.

An upland clay loam, of moderate fertility, with a judicious application of manure, is considered the safest place for raspberries.

Seldom has it been our good fortune to be so pleasantly and profitably entertained, as at the Ohio Reform School. Now, Mr. President and gentlemen, we have given you the result of our observations in this successful grape-growing district, but just why grapes succeed better in Fairfield county than elsewhere in Ohio, you, perhaps, are as well prepared to judge as we. Our opinions may be formed from observation; you may judge from cause and effect, which is the safest criterion.

We are well aware of the fact that many theorists entertain very mistaken ideas in reference to grape rot, which is the chief cause of failure. Many suppose it to be the result of too close pruning; others are quite as firm in the belief that it is the result of leaving too much wood and foliage on the vine. I am entirely satisfied that neither practice has any influence whatever in producing the disease. All modes of pruning are adopted in Fairfield county, from the long cane on wire trellis, to the shortest renewal system. Some give clean culture, others sow their vineyards to grass; yet on the elevated sites all succeed alike.

When the rot first appeared in our own vineyards, my friend, the late M. B. Bateham, visited me, and with all confidence said the cause was self-evident; that we had grown heavy crops of grapes for years, and had exhausted certain qualities in the soil, and they rotted for want of plant food. That Mr. Bateham's theory had no foundation in fact, has long since been demonstrated. Many suppose it to be the result of the depredations of the Phylloxera at the root. This is also a mistaken idea. Phylloxera were as numerous on the roots of grape vines in Ohio twenty years ago, as now, yet our Concord vineyards in Richland county produced from three to five tons per acre, annually, and the bunches were so perfect that not one hundred pounds of defective grapes were left on an acre, after marketing the crop. Some sixteen years ago, T. S. Hubbard, of Fredonia, New York, called at our place, and while looking around in the vineyard, asked if we had Phylloxera in our vineyards. I told him I thought not. He said, "I guess you have, and if you will get me a spade I will convince you of the fact." I did so, and we found myriads of them on the roots of apparently healthy Concord vines, visible to the naked eye. I had noticed the effect of their depredations on the fine roots of grape vines, years before, but didn't know what it was.

The plain, unvarnished truth is, that much damaging theory is sent out, founded on unsupported opinions, instead of experimental tests and positive evidence. Our velop most rapidly under the influence of excessive heat and moisture. If the own private opinion is, that grape rot is a local infection, caused by a minute parasitic fungus. The spores light on the grape, and these fungi propagate and de-atmosphere is dry and cool, the spores do not grow. In support of this theory, I will say that I have lost thirty tons of grapes by rot, in three days of warm, sultry weather, after a warm rain in July, fully two-thirds of the crop rotting. Then by a sudden change in the weather, a brisk, cool wind from the northwest, the thermometer dropped to 60° or 65° Fahrenheit, checked the rot in a few hours. There was but little more rot for two weeks, but on return of warm, wet, muggy weather, the entire remaining crop rotted in a few days, so that we did not get a basket full of good grapes from twelve acres of vineyard.

It is well known that clusters of grapes protected by paper sacks remain sound, while unprotected bunches on the same vine will rot. We have also noticed that

vines allowed to run on trees, appear to find protection from dampness, and remain free from disease, while the grapes on a branch from the same vine, on an open trellis, will rot. A grape vine trained on the end of a building, where the projection of the roof overhangs the wall, so as to protect the vine and fruit from heavy dews and rain, will often ripen its fruit in perfection, while rot will destroy the grapes in the open garden close by.

We mention these facts merely in support of our opinion, that elevated sites, where there is a constant circulation of dry air, preventing deposits of heavy dews, and driving away excessive moisture, and a soil where rapid drainage can be secured, is the only safe place for vineyards.

Hence we see that agricultural and horticultural pursuits are only successful on soils and in localities adapted to the different branches. This is practically demonstrated by example on the two farms belonging to the State, the University farm, on the Scioto, and the Reform School farm, on the elevated lands of Fairfield county. The soil, as well as the local position of the two farms, is as different as can well be imagined, and although not over thirty miles apart, the crop that would succeed on one, would most certainly fail on the other. Brother Lazenby can raise seventy-five bushels of corn per acre on the University farm, while on some parts of the Reform School farm it looked to us as if it would keep Mr. Smith scratching to raise seventy-five bushels of nubbins on ten acres. Yet the Professor would have to sell his "Leaming" corn to the same class of men that buy "Bohemian oats," in order to get even with Mr. Smith, with his three tons of grapes per acre, worth \$70.00 per ton; his one hundred bushels of Turner raspberries, worth \$3.20 per bushel; and his one hundred and ten bushels of strawberries, worth \$3.00 per bushel.

When we visited the Experiment Station, Mr. W. J. Green, the Superintendent of the Horticultural Department, was absent, but through the courtesy of Professor Lazenby, we were referred to the different departments, including fifty acres or more of corn, which would yield an average of near seventy-five bushels per acre. The experimental corn-field, comprising several varieties of corn, and all under careful culture, except a few rows which had been plowed but once, and eight or ten rows not cultivated at all. This, I suppose, was a test as to whether a successful crop of both corn and weeds could be grown on the same ground at the same time, even with a liberal application of commercial fertilizers.

Many farmers in Ohio have been experimenting on this thing for years, apparently without arriving at any definite conclusion. Perhaps when the Professor reports the result of his experiment, it may help to settle this question beyond a doubt.

The University farm is well adapted to grain and stock growing, but not so well to horticultural pursuits. The apple trees were looking badly; the pear trees, worse. The grape vines had been damaged by the past severe winter, and were not fruiting; and the raspberries not nearly so successful as on more elevated sites of much less natural fertility.

Hence, we see that horticultural pursuits are only successful in localities and on soils adapted to the healthy growth of trees and plants.

Finally, your committee feel quite safe in saying that in scarcely any other pursuit or occupation, is there a greater want of knowledge, especially of what are called the natural sciences, than in the different branches of horticulture; and yet no enterprise or pursuit is seemingly less understood, or more neglected by the majority of those who till the soil. And now, Mr. President, and gentlemen, fully realizing the importance of this subject to the community, and feeling that a satisfactory solution of the mysterious problem referred to your committee, would be attended with difficulties of no small proportions, it is with a degree of diffidence that this report is respectfully submitted.

Mr. Palmer displayed a number of specimens of stones from the vicinity visited by the committee, which he left in the hands of the Secretary to be examined.

During the reading, and after its close, Mr. Palmer added the following remarks:

As a whole, peaches kill at ten to twelve degrees below zero. I saw a peach tree in Lancaster heavily loaded, and those in Mr. Snider's yard had a nice little crop of peaches. How it was that they escaped, when the mercury went twenty-eight below zero, I don't know.

Secretary.—I regard this paper of Mr. Palmer's as a very valuable and interesting one. I would like to make some very brief remarks upon two or

three points. First, in regard to the grape, Missouri Riesling, which is described as a white or light green grape. There may possibly be some mistake about this grape, for there were a good many of these grapes produced at about the same time by Nicholas Grein, of Missouri, from seeds of the Taylor, or Bullitt grape, and which were introduced about the same time, most of them designated by numbers only. Missouri Riesling and Grein's Golden, I think, were the only ones which were named. The Missouri Riesling I received from Mr. Husmann several years ago, and I find that instead of being a white, or light green grape, it is, when fully ripe, of a pink, or light red color, somewhat lighter than the Delaware.

Mr. Palmer.—I would like to ask Mr. Snider if they are not light red when ripe?

Mr. Snider.—Yes sir.

Secretary.—Those were very interesting facts about the peach trees found in bearing in that section. The reason for that, I suppose, was the condition of the trees. I have known peach trees to escape injury when the mercury was twenty degrees below zero, and be injured badly at zero. It depends on the condition of the buds. These grapes, the Riesling and Elvira, will probably never be favorites for the table. They all have the peculiar, immature, flavor of the Bullitt. They are recommended and largely planted upon the Islands of Lake Erie, and in other wine-making districts, and are increasing in favor for the manufacture of light, white wines. It may be that white wines are increasing in favor, because we are told not to look upon the wine "*when it is red.*" The freedom of vines from mildew, when protected by buildings or trees, I think is largely due to the fact that they are protected from sudden changes of temperature.

Mr. Campbell then presented a paper upon the subject of Mildew and Grape Rot.

MILDEW AND GRAPE-ROT.

These two maladies, at the present time, present the greatest obstacles of all others to successful grape-culture; and, in many places, their attacks have been so disastrous as to quite discourage the planting of vineyards. Recent investigation and discovery have thrown much light upon the character and causes of both diseases, and suggested probable remedies for their prevention. Mildew, or *peronospera*, which attacks the foliage and sometimes extends also to the young and recently-formed fruit-clusters, has been long known to attack varieties with thin and delicate foliage, while others with thick and leathery foliage, usually escape. The remedy has hitherto been sulphur applied in some form, and, when used in time, before the disease has made much progress, has generally been effectual in checking, or, at least, in modifying its ill-effects. It has, however, always appeared more effectual as a preventive than as a cure; and only when applied upon the very first indications was any good effect manifested. My method of application has been in mixture of about half sulphur and half quicklime, blown through a bellows prepared for the purpose, in a fine cloud, upon the foliage and fruit, early in the morning, while slightly wet with dew.

The grape-rot, which often accompanies mildew, and which, when present, seems to aggravate and increase it, has not been so well understood; but the researches of Prof. Burrill, of the Illinois Industrial University, and others, have determined that it is a fungus disease, generated from minute spores of *Phoma Uvicola*, which float in the air, and, under favorable circumstances of warmth and moisture, attach themselves to the surface of the growing grapes and produce the malady which we call rot. It has been stated that these spores will not germinate in a dry atmosphere, and that they will perish unless the temperature is about sixty degrees. The following replies by Prof. Burrill to questions from Mr. Riehl, of Illinois, present, probably, about the latest intelligence we have in this country as to the rot and its methods of reproduction.

First.—Do the spores of the *Phoma* retain their vitality for more than one year?

Reply.—"Although the *Phoma* spores germinate as soon as mature when under

favorable circumstances, they do sometimes retain their vitality over winter. They germinate very readily the following spring, but I have failed to keep them in any way so as preserve vitality during the ensuing summer. If moist, they germinate, and, if kept dry, soon lose their power to do so. I think it very improbable that these spores, under any circumstances, live more than one year.

"Possibly they may, under some circumstances, retain their vitality more than one season, but this is not probable. There are probably few of them, and that the principal contagion comes from the *Phoma* spores of the current year."

Second.—Will the *Phoma* grow and mature spores if the grapes are pulled off and thrown upon the ground as soon as the rot makes its appearance?

"In answer to your second question, I can positively say that the spores from the rotten berries on the ground do become dispersed and germinate during the current year, and sometimes, as said above, the second spring.

"Some spores will mature on the pulled grapes if the rot shows enough to be ordinarily noticed. At this time the mycelium has penetrated the substance of the berry, and there is enough of nutriment in the berry to permit the ripening of the spores first formed. The number, however, will be very much less than would mature if the grapes were not taken from the vine."

Third.—How soon after the rot makes its first appearance will there be matured spores of the *Phoma*?

"In about one week. This will be modified by what is taken as the 'first appearance,' and, to a considerable extent, upon the rapidity of growth due to peculiarities of the weather, etc. Under usual circumstances, it requires nearly two weeks from the time the fungus penetrates the fruit, before the first spores mature, after which there is a continual succession of ripening spores. The first indication commonly observed of the rot is a pale, brownish spot on one side of the berry. At a later time, say three or four days, this spot will have increased in size, covering, perhaps, one-fourth the surface of the fruit. By this time, if one looks very close, especially with a magnifier, minute watery specks may be seen clustered together in the center of the brown area. In two or three days more, the skin of the berry shrinks, and these minute specks will be now found as little spheres, each of which pushes up the grape skin as a point. The spores, at this stage, are fully formed, and contained, like eggs in a basket, in the visible spheres. Still a little later, the spores issue from an apical puncture of the spherule as a whitish mass of very small extent, but containing vast numbers of the reproductive germs. These latter are now capable of germination whenever the conditions are favorable for this process, and it takes place indifferently on the surface of another grape berry, or anywhere else. On the former, the rot is reproduced; elsewhere, death is the result."

In addition to the above, I will give the latest experience and observations upon the subject from the old country, which I have translated from the Official Journal of France. A paper read before the Academy of Sciences, October 5, 1885, and sent me by Mr. Chas. Joly, Vice-President of the Central Horticultural Society of France,

After some remarks upon the invasion by the *peronospera* or mildew of the vineyards in the north, in the region of Touraine, in 1885, the Secretary presented a letter from Mr. M. A. Millardet, relative to the treatment of the vines affected by the mildew and rot.

Mr. Millardet asserted that vines had been rendered entirely exempt by the use of a mixture of slacked lime and sulphate of copper. This treatment having been highly recommended last year, many proprietors of Medoc had made the application on a large scale, and the results of these experiences are thus given:

To-day, the 3d of October, 1885, he writes, the vines which were treated, have a natural and healthy growth; the leaves bright green and perfect; the grapes are black and perfectly ripe. On the contrary, the vines not treated, present an appearance the most miserable; the greater part of the leaves have fallen; the few which remain are half dry; the grapes, which are still red, can serve no other purpose than to make an inferior, sour wine. The contrast is most striking. That the Academy may be assured of the exactitude of the facts reported, photographs of the vines and the foliage are joined to this letter.

I add also the following statement from my colleague, Mr. Gayon, Professor of Chemistry of the faculty of sciences, who has examined the musts produced, both from the vines treated, and those not treated. He found from the same variety (the Malbec), that the vines treated, gave a must containing 177 grains of sugar to the litre, while that from the non-treated vines gave less than 92. And the acid in the same experiment was 7.7 in the non-treated vines, and but 5.1 in the others.

That which augments the value of the experiments of which I speak, is that they

have been made in the most careful and methodical manner. In every piece subjected to the treatment, were found also many rows of vines not treated. I will remark here, that the treatment was given by preference, to such varieties as were the most sensitive to attacks of mildew, the Malbec, the Cabernet franc, and the Petit-Verdot, in order to render these experiments more satisfactory than if they had been applied to varieties less subject to the malady. I will also add, that this year the mildew has been exceptionally destructive.

In view of the results attained, I feel myself authorized to declare in the most explicit manner, the efficacy of the treatment of which I speak, against this scourge, which, until now, has baffled Europe as well as America, the mildew proper, and the rot, or mildew of the grape.

I will now speak of this treatment; in what it consists, and how, and when it should be applied.

In 22 gallons of water, dissolve 17 pounds of sulphate of copper (blue vitriol), of commerce. Take also 33 pounds of stone lime, and slack in seven gallons of water, and mix with the solution of sulphate of copper. This will form a bluish mixture, which should be well shaken up, and can be sprinkled upon the foliage from a pail carried in the left hand, by means of a small whisk-broom, taking care not to touch the grapes. No injury, however, need be feared to the most tender organs.

With Mr. Johnson, 11 gallons of the mixture was sufficient, in general, for 1,000 vines.

The application was made from the 10th to the 20th of July. In some cases the operation was repeated about the end of August, but without apparent advantage. It is considered established that a single application is sufficient.

The mixture as soon as dry, remains very adherent to the leaves. Since the treatment, the vineyards have endured several storms during the month of August, and frequent rains in September. Notwithstanding, one can easily see, upon more than half the leaves, the points which have been touched by the mixture. But those which retain no traces of it appear equally healthy and in good condition.

It is not necessary that the leaves should be covered with the mixture, and I believe I can say that a single spot upon a leaf is sufficient.

Continued experiences have shown that I was right, in insisting in my communication of the 1st of May last, before the Society of Agriculture of the Gironde, upon the necessity of making the treatment in a manner preventive; that is to say, as soon as the mildew makes its first appearance in the vineyard to be preserved. All who have used the treatment upon vines already seriously affected, have received but little benefit.

There is but one other important point to consider. In spite of all precautions it will happen that some drops of the coppery mixture will fall upon the grapes. Can any traces of copper be retained in the wine? And if so, can it be in sufficient quantity to prove injurious to health?

My colleague, Mr. Gayon, has promised me his co-operation to determine this question. A preliminary experiment made by him upon about two pounds of grapes taken from vines which had been treated, did not reveal any copper that could be appreciated. Experiments will be continued in this direction, and I hope soon to be able to submit the results to the Academy.

I hope myself to make some experiments with these mixtures the coming season, and to report results. A member of the State Horticultural Society, Mr. Miller, of New Philadelphia, reported that vines which were treated with sulphate of iron by sprinkling it upon the ground, were free from rot the past season, while the same varieties not treated, were badly affected.

It is now considered as pretty well ascertained that grape rot is not a disease of the vine, or of the grape properly speaking, but that it is caused by a specific parasitic fungus, which is only developed under favorable conditions of heat and moisture. Inclosing the grapes in bags, if performed early, is a preventive; and a prompt removal and destruction of all infected grapes would probably greatly lessen, if it did not entirely prevent, the continuance of the malady.

But, notwithstanding all discouragements, when I think of the wonderful advance which there has been in grape culture in this country, since my first efforts in grape growing, when the Isabella, the Catawba, and the Clinton were the only cultivated varieties known, I feel as though we may look for further improvement, almost without limit. Instead of three varieties, there are now of named varieties in the various catalogues of our nurserymen probably more than three hundred. There were 249 distinct named varieties of grapes exhibited, of American origin, including various hybrids, crosses, and seedlings, at St. Louis, at a meeting of the Mississippi Valley

Horticultural Society, in the fall of 1880, which was probably the largest exhibition of grapes ever made in any country. Large as this collection was, it by no means included all; and there have been many new varieties of merit since added to the list. The last catalogue of Messrs. Bush & Son & Meissner, of Missouri, contains about 350 varieties. There are many persons now engaged in the production of new varieties by the agency of hybridizing and crossing, as well as by natural seedlings; the good work of improvement is still going on, and I do not think it an extraordinary prediction that when the subject is better understood, and when better and more intelligent systems of care and culture are adopted, and when varieties are selected adapted to particular localities, we shall not only be the greatest grape-growing people, but produce the best grapes grown upon the earth.

President.—Gentlemen, you have all heard this paper. Are there any remarks upon the subject?

Mr. F. C. Miller.—Six or seven years ago, my grapes nearly all rotted. I had about one hundred vines. Five years ago, at the beginning of August, we had a hot, sultry, wet spell of weather. The mildew set in. I got a bucket full of sulphate of iron, and sowed it broad-cast on the ground. The rot and mildew immediately ceased. I have applied it every year since.

President Ohmer.—You have had no rot since?

Mr. Miller.—No, sir; when I didn't apply it, the mildew appeared.

Mr. Wilson.—Among twenty-two varieties of grapes that I have in cultivation, the Elvira and Missouri Riesling are entirely worthless. I have discarded their culture, for the reason that the fruit cracks so badly it does not mature.

President.—Where do you live?

Answer.—In Hardin county.

Mr. Cushman.—I would like to ask the gentleman who used the sulphate of iron, what amount he used?

Mr. Miller.—I used half a bushel to one hundred vines.

Mr. Cushman.—It has been claimed that Mr. Snider's grapes grow without any fertilizers whatever, on this land that wouldn't raise white beans. It might be as well for us to say that he does use fertilizers for his grapes, in the shape of all the barn-yard manure that he can purchase.

Mr. Miller.—In our neighborhood, the vineyards on the hill ground have been abandoned, whereas, the low ground has been much more successful.

Mr. Palmer.—This matter is mysterious. You might as well get up and demonstrate what is called pear blight, as to explain grape rot. Where I live, we are in a valley. Our grapes all rotted this year, and have for a number of years. Across the valley from us, they raised a fine crop of grapes in their gardens on trellises. What is the reason of that, we cannot explain.

Mr. Snider.—In regard to the rot in my vineyard. It has been said here that the soil is too poor to raise white beans. I think that the soil is so poor it cannot create rot. I do apply barn-yard manure, with good results, and my grapes have been yielding for the last thirty-seven years. I never missed but one, and then it froze in May, three years ago, with ice and sleet. I have never had any rot except on the Concord and Catawba. I think we must plant grapes adapted to the soil.

Here Mr. Palmer displayed a sample of a grape leaf he gathered on Mr. Snider's place.

Mr. Wm. Longstreth, of Dayton.—This seems a suitable time to give my experience. Fifteen or twenty years ago, I planted one hundred Concord vines, and fifty Catawbas. The elevation was two hundred feet, in the Miami Valley, protected by timber on the northwest. They began to bear in about three years. There was no grape rot. The Concord did well; the Catawbas did not. After a few years, the Catawbas all rotted or mildewed, except one branch, that grew close to a peach tree. It ran up the tree twenty or thirty feet, and there were more grapes on that vine in one year, than on all the rest

of the Catawbas. In a year or two, the Concords began to rot. I gave it up then. A gentleman in Cincinnati told me to train them up on rails of white oak, eight feet from the ground, and to pick off all the leaves up to the lower rail of the trellis, three or four feet from the ground. I took the leaves off, and they did better. Then Mr. Trowbridge told me to sack the grapes, and they wouldn't rot. I used paper sacks. I also put ashes on the ground, with lime, and a little salt. Last year, and this year, some varieties averaged twenty pounds of good grapes to a vine. This year, all Catawbas that were sacked were ripened. The aroma was excellent. I believe that wood ashes, lime, and salt, are mineral manures which are profitable in grape culture; but to sack the grapes about July 20, and from that up to the 25th, is a perfect remedy. You will have them all safe from rot.

Mr. Carey.—I have some two or three hundred vines. This year I have resorted to the plan of sacking them, which is a very easy thing. A man will sack from one to two thousand in a day. You may begin early, when the plants are in bloom. I want to confirm what was said about ashes. I have used ashes for two or three years. I use coal and wood ashes. The coal ashes are one of the greatest disintegrators that you can have. It will open the ground. Wood ashes make a most excellent fertilizer for the grape.

President Ohmer now announced that it was time to take up the question: What varieties of apple, pear, cherry, plum, and peach trees have proven most hardy during the past three severe winters?

Mr. N. H. Albaugh said that for the Miami Valley, the Red Astrachan, the Duchess of Oldenburg, and the Wealthy had proven hardy.

Mr. Farnsworth mentioned Grimes' Golden and Tallman's Sweet. He said he had noticed no peaches that were hardy. They had all been killed. Pears had all stood the winter except the Souvenir.

Mr. Moore mentioned the Ben Davis and Northern Spy in apples, the Early Richmond cherries, and the Tyson pears.

Mr. Miller.—I think Mr. Campbell said that the Kieffer is hardy. Is that so, Mr. Campbell?

Secretary Campbell.—No, sir; not in my vicinity. They are all dead.

Mr. Longstreth.—I would say the White Pippin stood the cold of 1880 better than most others. It has ripened its fruit, its leaves remain green, and when all the other fruit has dropped it stays on the tree. It is freer from insects than any fruit I have.

Mr. Farnsworth.—I neglected to mention the Beurre d' Anjou. It is one of our hardiest and best varieties.

Mr. J. G. Bilderback, of Holmes County, recommends Grimes' Golden, Tulpehocken, and Baldwin. Of cherries, he mentioned the Early Richmond.

Mr. B. F. Albaugh mentioned the Pearmain apple and the Early Richmond cherry.

President Ohmer.—In my case, I might say they nearly all went through with safety. I have healthy trees of most of the leading varieties. We will now proceed with the discussion of the question: What blackberries, raspberries, and grapes? and which of the new raspberries, black and red, have proven most successful? Lucretia Dewberry, how has it succeeded the past season?

Mr. Miller mentioned the Gregg and Shaeffer's Colossal raspberries as having stood the winter well.

Member from Hardin County recommended the Doolittle, Tyler, and Souhegan. He said the Turner stood the winter well, but did not fruit well.

Mr. Cushman mentioned the Gregg, Chapman, and Doolittle in black raspberries, and the Cuthbert and Brandywine in red.

B. F. Albaugh.—I found the Hopkins came through alive. Of red, my favorite berry has been the Reliance. I also found the Shaeffer's Colossal very hardy, and bore a full crop. Of blackberries, I found the best and hardiest was Snyder; next, Stone's Hardy. I found the Taylor not quite so hardy as the Snyder. Of the new varieties, I liked the Wilson's Early. The Wilson Junior did not stand the winter for me.

Mr. Palmer.—In regard to the Gregg, it is not entirely hardy in certain localities, yet it is our best black-cap, and so hardy as to have borne pretty good crops in favorable soils. It seems that almost everybody wants an early berry. Our most profitable berry is a late berry. If we can get something that comes in after everything else is gone, it is just what we want.

Member from Franklin County.—The Tyler is the best berry with us. It is four dollars a bushel when the Gregg is only three.

President Ohmer.—Have you the Souhegan?

Answer.—No, sir. I have the Taylor and Snyder blackberries. They stand the winter well.

President Ohmer.—Have you tried the newer varieties?

Answer.—No, sir. I have the red varieties, Ancient Briton and Turner. They stand the winter, and bear well.

Mr. Crawford.—A large black-cap, a few days later than Gregg, is what we want. Mr. Henry Young, of Hardin County, has such a kind—the Ada.

Mr. Young.—I am not here to put this variety before this Society. It has to be tried further. It has done well with me.

Mr. Farnsworth.—I would like to hear something about the Uncle Tom blackberry.

Mr. L. B. Pierce.—I had a vineyard of a thousand vines that did well for a few years, and then began to rot. I neglected it for five or six years. I had previously on a part of it some blackberries. Seven or eight seedling blackberries came up on this old piece, and at least five or six of them were as fine as you ever saw. This particular variety spoken of, was the earlier of two that grew near together. I exhibited it at the Horticultural Society two or three times. It is very sweet and good, and ripens quickly. Mr. Crawford thought enough of it to take it off my hands. It is really one of the finest blackberries that I ever saw. Mr. Crawford sold it to Mr. Lovett.

President Ohmer.—Has any one tried the Lucretia Dewberry and fruited it?

Mr. Crawford.—I fruited it one season.

The President then called for a paper by Mr. Farnsworth.

NOTES AND OBSERVATIONS ON SMALL FRUITS FOR THE SEASON OF 1885.

BY W. W. FARNSWORTH, OF WATERVILLE.

It is interesting and instructive at the close of another season to look back and see which of the many varieties have stood the test, and which have been found wanting.

Beginning with Strawberries, we find the Wilson losing ground in our neighborhood. It is a weak grower on our sandy loam, and is inclined to rust badly, does not bear well, and, in short, is an utter failure, so that in planting five acres last Spring, I only set one row of Wilson. It does better on the clay, a few miles from us. The fruit seemed to be darker than usual this season; and after standing a few hours was not nearly as attractive as the fresher-colored Crescent, which is superseding it in our market.

The Crescent stands clearly at the head of the list for profit, as grown on sandy and loamy soils.

They did not seem to be quite as perfect as usual, this year. In my own patch, I planted every seventh row with a staminate variety, and as the winter destroyed the bees in the neighborhood, the blossoms did not seem to be sufficiently fertilized.

My reason for planting so sparingly of staminate, was, I knew of none that were profitable with me, as neither the Wilson or Sharpless pay for the ground they occupy, although the Sharpless yielded better than usual this year, probably because there were no frosts to injure the blossoms.

Windsor is a very good market variety, holds out well in size, but is soft and sour.

Chas. Downing is worthless with us—rusts badly. On clayey loam, near here, it is said to do better.

Miner is a fine variety for home use or near market. Does well on heavy soil.

The Green Prolific still has many friends, who have been saying some good words for it of late. Like many other good old varieties, it came near being buried beneath the multitude of newer varieties, very many of which are far inferior to it. Its chief value is for home use, or near market.

The Jumbo seems to be the same as the Cumberland; a good berry of fine quality and appearance, but only moderately productive.

If the Sucker State succeeds as well here as in Southern Illinois, we will probably find in it, a satisfactory variety to fertilize the Crescent. I fear, however, it may be easily injured by frost when in bloom.

Bright Ida is a fine grower and productive of firm fruit in abundance. The fruit stalk seems rather weak, and the fruit ripens somewhat unevenly.

Daniel Boone did very well, except that it rusted some.

Mrs. Garfield rusted badly; fruit small but handsome.

Jersey Queen—large, handsome fruit of the finest quality, but not enough of it to be profitable, unless it does better with hill culture.

I fear our hopes of finding in the Manchester, a profitable late berry, will not be realized, as it seems disposed to rot, at the slightest provocation.

Lacon lacks productiveness, and the fruit lacks quality.

Ironclad is rather small, and ripens the bulk of its crop when prices are low.

James Vick is a failure, when grown in matted rows. May do better in hills, but would, I think, be easily destroyed by Spring frosts.

Bidwell is a very promising variety, but like some very promising men, it never pays. I shall discard it.

Waterville Seedling is the name of a variety originated by my neighbor, Mr. Eastwood. The fruit is medium to small in size, of a pale, glossy appearance, very vigorous and productive; fruit of the best quality. May prove valuable for home use.

In Raspberries, the Cuthbert still takes the lead among the red varieties, and would be my choice, were I confined to one variety, as the Reds succeed better in my soil than the Black Caps. The canes in my own field, were not injured in the least, by the severe winter, and bore a full crop of fruit, which is handsome, large, fine, and of good quality. Some older patches were somewhat injured by the winter.

The Brandywine is a profitable variety with me, though rather slow in coming into full bearing. I seldom sell them to personal friends, however. They usually get Cuthbert or Shaeffer.

Superb, is, indeed, a superb berry in appearance, but has rather disappointed me. It is not firm enough, nor productive enough.

Welch is early, and very productive for the size of the bush, which is small. It is too soft and dark for market.

The Reliance is not profitable, as it is only moderately productive, crumbles badly, and the drupes do not ripen evenly, thus giving the fruit a mottled and unattractive appearance.

Hansell is doing well, and held out well, giving good pickings about as late as any variety except Cuthbert.

Crimson Beauty was destroyed by the winter.

Marlboro' is doing finely both in bush and fruit, though the quality is not very good.

Turner was very profitable this year, especially on light soil. A small patch of them on rich clay loam have grown well, but produce very little fruit.

Beebe's Golden is hardy and vigorous, but fruit is small.

The Gregg, although the leading Black-cap, does not seem at home on my soil, and only succeeds moderately well. I am hoping to find the Ohio better adapted to my wants. It is doing well so far. Tyler and Souhegan came through the winter in good order, and bore well. They have the same failing with the Doolittle, however, viz., the fruit is small, after the first few pickings. Mammoth Cluster did very well this year. When quality is the prime object, I think the Seneca stands at the head of the Black-caps. It is also of good size and productive.

Shaeffer is a wonder. It is truly colossal, both in bush and berry. The former requiring eight feet between the rows in good soil, and the fruit excelling everything

else in the raspberry line in size. We measured specimens last summer that were three inches in circumference. I have great hopes that Mr. Palmer's Seedling will supply a want in raspberry culture, viz., an early Black-cap that is hardy, productive, and of good size.

In blackberries, the Early Cluster has been another failure. I set a few plants on rich, dry, sandy loam in the spring of 1884, and the plants are not over eighteen or twenty inches high now, and seem to be trying to crawl into the earth and hide themselves.

Stayman's has not done much, after two season's growth; it roots like black raspberries.

Snyder is still reliable and hardy. If the fruit were only larger and sweeter, we could hardly wish for anything better.

Taylor is a very valuable variety. It usually bears the next season after being planted; is nearly or quite as hardy as Snyder, and larger and much better quality, there being no hard core to it.

I think both the Taylor and Snyder require rich and dry soil. In fact, I think any tree or plant is better able to withstand the winter when grown on fertile, well-drained soil, if not forced excessively, or cultivated too late, than when grown on poor soil. I have often noticed that the rankest and strongest canes were the least affected by the winter.

Stone's Hardy is growing finely with me, but has not yet fruited. It is said to be hardy and productive, but too small.

Western Triumph is said to be a shy bearer.

Among currants, the Victoria and Red Dutch are my favorites, although Fay's Prolific may supersede them. The Cherry and Versailles, which are nearly identical, are larger, but not as productive. The Victoria is quite late. White Grape and White Gondoin are much alike, except that the White Gondoin is much the better grower.

The Long-bunched Holland did remarkably well this year.

For some reason, my Fay's did not bear this season. The bushes have not grown very vigorously, but the fruit has been fine.

It is useless to plant white currants for the Toledo market, as they only bring about half the price of the red ones.

Black Naples is a very strong grower, but the fruit does not suit my taste nor smell; and I hardly think they would be profitable to plant largely for market. The fruit of Lees' Prolific is larger, but the bush is smaller.

I set out about a thousand young plants last spring, mainly Victoria and Red Dutch, and only lost one. The plants also made a very fine growth. I attribute this partly, at least, to the very severe cutting back which I gave them at planting.

While reading, Mr. Farnsworth added the following remarks:

The Lacon strawberry is a very peculiar variety. A person passing by a field of strawberries could select the Lacon from any other variety. It grows naturally in hills.

My patch of Cuthberts, this year, yielded seventy-five bushels per acre. I put ashes, seventy-five or a hundred bushels per acre, on one side of the patch, and I think I can safely say, that one row fertilized by ashes yielded as much as two rows without ashes. The soil is a sandy loam. I find that the red raspberry will succeed in moist soil, but the black ones are a failure wherever the ground is inclined to be wet.

In regard to the Reliance, my bushes were very thrifty, and were very promising, before fruiting time; but I found the fruit was not very plenty, and, when I went to pick it, it crumbled badly, and I didn't ship it.

President Ohmer.—They did well with me.

A member suggested that it was the lack of the season.

Secretary.—That is more the way the Superb serves a good many people.

Mr. Farnsworth.—I have a small piece planted with Turners. The ground is rich. They are almost an utter failure. The fruit is small, and there is very little of it. However, two of my neighbors had very profitable crops of Turner this year.

Of Beebe's Golden, the fruit was quite small and rather dry. I didn't like it at all, this season. The plant grew very vigorously.

I will say, right here, that my success with the black-caps is not so great as with the red raspberries. The soil is best adapted to the red.

Member.—Is it black soil?

Answer.—Not much of it. It is chocolate-colored soil.

President.—Is it not naturally wet?

Answer.—Not much of it naturally so. It isn't swampy soil, by any means.

In regard to the Shaeffer, I would say that I had some fears about planting it extensively. The commission merchants said they could hardly ship it to advantage. After they were introduced at home, I could not get enough for home demand. Every one chose the Schaeffer after testing it. I had more orders than I could supply. When you can sell at home, that is the berry to raise. I picked every day, and then found them perfectly ripened.

In regard to the Black Naples currant, it has been suggested that by canning and preserving they might be improved. We didn't try it. My wife wouldn't let me bring them into the house. They are offensive.

Mr. Palmer.—Mr. Farnsworth's land is what we call black-swamp up here. They have made a very productive country out of it. I saw his fruit before ripening. There is something peculiar about it. The soil is a sandy loam, very rich, and they will grow twice as many bushels of corn to the acre as we can grow, and while his Cuthberts far surpassed ours—yielding twice as much, our Greggs surpassed his as much.

Mr. Pierce stated that one thing had been alluded to, that he would like to hear more about; and that was the condition of plants when they went into the winter. A nurseryman had told him that trees were likely to winter-kill, if the conditions had not been right on going into the winter. He would like to hear more of it.

Mr. Jameson, of Lebanon, wished to say a word in defense of the Sharpless strawberry. He tells of raising nine bushels and three pecks on ——— the past season, and he has not heard of its being equaled in Ohio. The Sharpless is a great strawberry in our locality.

President Ohmer.—We all admit that berries differ in different localities.

Mr. Palmer.—This question of going into the winter wet or dry is an important one. He related that, one winter when it was very dry, he lost all his grape vines. They froze out. At another time, he put his vines in a ditch in clay soil, and covered them with corn fodder. A neighbor had buried his vines in sand, supposing they would go through the winter dry. There had been no rains to moisten them, and in the spring the neighbor found his vines all dead, frozen out. He went to his own and threw off the corn-fodder, and in the clay soil found them green; even the little young roots were sound. They did not bear so much fruit that season, but the next season they did well.

Mr. Harrison.—If the ground is very dry when the trees go into the winter, and the winter is severe, without much snow, we shall lose a good many trees. I know of one winter, a few years ago, trees that were forty feet high died from the soil being so dry. In the spring, the leaves started out and made a good growth; but in June they went back and died. When we examined the roots, we found they were winter-killed from the dryness.

Mr. Pinkham asked for information about the Cornelia strawberry.

Mr. Miller.—I received thirty-three plants, last spring, of the Cornelia. I didn't know then where friend Crawford lived. I planted those thirty-three plants on the fifteenth day of May. The fruit was very good. It was rather

late. I have propagated from those thirty-three about a thousand plants. So you may know I appreciate it.

Mr. Albaugh.—It is very promising with me.

Mr. Farnsworth asks information about the Sucker State.

Mr. Carey.—I put it at the head of the list now in cultivation. I raise the Mt. Vernon, Cumberland, and Kentucky, and I will not discard the Wilson. I have two varieties that I got from the East. One is the Parry.

President.—Have you fruited the Parry?

Answer.—Yes, sir. It is fine. Almost all of our fine varieties are soft. This seems to fill the bill better than any I have seen.

Mr. Trowbridge.—In the vicinity of Cincinnati, we have three market berries. Crescent takes the lead, and we grow also the Wilson and Kentucky quite successfully.

Mr. Pierce had grown Wilson very successfully, last season, and should try it again. He would like to know how they grow Kentucky about Cincinnati, and what is the yield? Do they grow it in hills, or matted rows?

Answer.—In matted rows. Mr. Carey has the most magnificent Kentucky strawberries I ever saw.

Mr. Crawford.—Would it be in order to speak of new varieties that are not in the market? I have three that Mr. T. T. Lyon sent me.

Mr. Trowbridge recommends the May King highly. It is of very fine quality, and the foliage healthy.

Mr. Barlow, of Barnesville, reports a yield of three hundred and fifty-one bushels of the Sharpless strawberry per acre. I would say that this variety has been more satisfactory to us than any other we have. We plant from two to three acres yearly, and, last year, we planted three-fourths of them Sharpless.

Mr. Harrison.—I don't know what Brother Crawford has to say, but it seems to me that if he knows about any new varieties he should be heard.

Mr. Crawford.—It is something I have no interest in. Mr. T. T. Lyon sent me three varieties, a year ago last spring. They were originated by Mr. Hathaway. I wish to speak particularly of No. 5. It is a remarkable berry, a great bearer, a great grower, and a very long berry. Both plant and fruit are made on the long principle. The berry will often be two inches long and one inch in diameter. I think no one will run any great risk in getting it when it comes out. The No. 3 is very prolific. The Bonanza is also a remarkable plant, remaining green all this summer when nearly all varieties rusted badly, and bore a moderate crop of large and good berries. Jessie, from Janesville, Wis., fruited just once. It is the most remarkable berry ever sent to me for trial. In hardiness, productiveness, perfect bunches, and freedom from rust, it seems to be about all one could ask. It is a late berry, and very large and good. I have heard great accounts of it. The originator has written me that it has yielded at the rate of six hundred bushels per acre on a small patch. Thirteen berries make a quart.

Mr. Pierce.—I am glad to see that Mr. Barlow, one of the celebrated strawberry growers, is present. He calls for further remarks from Mr. Barlow.

Mr. Barlow.—I will say a few words more in regard to the Sharpless. I believe it has been four years since we got started with the Sharpless. They have proven very satisfactory. Two years ago there was a nice crop of strawberries, and we had one acre of that variety which was rather above the ordinary. A Chicago man made us an offer for all we could grow. It was a very good offer, and we took it. There were just one hundred and twenty-seven bushels of marketable berries on that acre. We received six dollars a bushel for the Sharpless. That would make seven hundred dollars per acre. As to the Wil-

son, they used to be our best variety. Now, we can do no good with them. Our leading variety is the Sharpless, and the way that we get fair crops is by giving them tolerably high cultivation. There are men in Barnesville who do not cultivate very highly, consequently they do not reap so much benefit. The only way to make the berry business profitable, is to put on double the amount of work you think is really necessary, and you will be doubly rewarded.

Mr. Trowbridge says that the Sharpless is too soft with them, near Cincinnati, and is simply a grand failure.

Mr. Pinkham.—I wish to say one word about the Sharpless. It is the greatest berry I have had anything to do with, out of fifteen or sixteen varieties. I have discarded the Wilson. The Sharpless is the largest variety, the most hardy plant, and the most productive of any that I have cultivated, but it is tender to spring frosts. It is partially destroyed about once in three years in my locality. If it were not for this, I would raise it altogether.

Mr. Jenkins, of Winona, read the following paper on a "New Method of Preserving Fruit":

A NEW METHOD OF FRUIT STORAGE.

BY J. JENKINS, OF WINONA.

One of the easiest and most rapid profits that a horticulturist and farmer can take advantage of, is in the proper storage of the apple crop. The October and November prices of good winter-keepers is seldom more than one-third to one-half what the same fruit commands in the latter part of winter and early spring, so that a moderate amount of shrinkage from rotting, etc., may easily be met in the largely increased profit of late selling.

In earlier times when there was a greater lack of cellar room, quantities of apples were preserved for the spring market by simply burying them in the orchards where grown, in conical heaps, first placing straw over the heaps, then enough earth to prevent freezing. And even at the present time, some of the choicest apples that reach our late spring market are preserved in this well-known manner.

Simply a modification of this old and well-tried process is the method that I make the heading of this article.

Down a hillside, a V-shaped excavation is made, which may be several feet deep and eight or more feet wide, and in the bottom, extending its full length a trough is placed, made of a board one foot wide for the bottom, and boards eight inches wide for the sides, with a tile drain immediately below.

This trough, extending up the full length, and in the bottom of the excavation, is covered with slats one or two inches wide, nailed across not over one inch apart. The sloping sides are then covered with rye straw, and apples by the wagon-load are placed therein. Covered with straw and earth from above to prevent frost from reaching them, as is done in the old way of burying fruits.

The trough below gives a circulation of cold air, through all the apples stored above it, and ends in a draft-chimney at upper end. In the very coldest weather, the mouth at the lower end of the excavation may be closed; though while the thermometer remains twelve or fifteen degrees above zero, it has proved an advantage to let the cold air circulate through. But in warm weather it is an advantage to keep the draft closed, thus retaining the cold that is already there. This simple and inexpensive arrangement has preserved apples until very late in the spring, with scarcely any loss, and they came out for market, bright, crisp, and fresh, with no appreciable loss of flavor, and brought often treble the price they would have commanded in the best fall or early winter market.

Mr. Jenkins added the following: In our part of the country, we have a local apple, that some of our farmers have made a great success in raising, called Whinery's Late Red, originated in the grounds of Joshua Whinery. It has spread a good deal among our neighbors. It is good for market late in the spring, when everything else is gone. It retains its flavor remarkably. Such a thing as rotting it has hardly known. It is on exhibition on the tables above.

There being no remarks upon the paper, Mr. Campbell read a letter from Mr. Farr, upon the same subject.

MANTUA STATION, PORTAGE COUNTY, OHIO, *November 26, 1885.*

G. W. CAMPBELL, *Secretary :*

DEAR SIR: I regret that I cannot attend the coming meeting at Columbus. I have last year completed a fruit-house on the cold-air plan, and would like to tell the Society how I succeed; and I hope in some future meeting to be able to give my experience with it. I held the air from December 20, 1884, to March 30, 1885, with only a change of four degrees. I admitted the cold, dry air in the frosty mornings until I got it down to 34°, then closed up all the ventilators, and held it through the extreme cold winter of last year, with a change of only 4°. On the 21st of March, the thermometer registered 30°, and from that time to May 1st, the range was below 38°. I now have a few apples, the Ben Davis, which were gathered in October, 1884.

Yours truly,

A. N. FARR.

Mr. Pierce.—I have been at Mr. Farr's house and seen it. It is a two-story house in the side of a hill, protected by sawdust walls and sawdust in the upper story. He drains it by a pretty big pipe. It is a patented idea, that of admitting air into cellars through pipes.

Secretary Campbell.—Is there a patent on it?

Mr. Pierce.—Yes, sir; there is.

Secretary Campbell.—It seems to me that it is very valuable, from the fact that it is a most inexpensive method of preserving the fruit, there being no ice used.

Mr. McMaster then spoke of a fruit-house which has been before described, and also of a vinegar-generator, which has been patented. He exhibited a sample of vinegar which he said had been made from sweet cider, in three days, by this process. The best cider-vinegar, he claimed, could be made from new cider, in large quantities, in from six to fourteen days.

President Ohmer.—Tell us how it is done.

Mr. McMaster.—The cider is put in a tub, made for the purpose, and fitted with a plunger, made of lattice-work, which carries a hundred or more cubic inches of air down to the bottom. By a proper working of the plunger, and regulating the temperature, we can make more and better vinegar in fourteen days than can be made in a year in the ordinary way.

The Committee on Fruits made the following report through their Chairman, Leo Weltz:

He said they had not made a decision upon the seedlings, as they had experienced some difficulty. They had set them aside to be examined later, and the ladies, thinking they were set aside for them, had taken them.

REPORT OF THE FRUIT COMMITTEE, AND AWARDS UPON THE FRUITS ETC., EXHIBITED.

APPLES.

For the largest and best collection, to Hurst & Hurst, of Chillicothe, for 80 varieties, first premium, \$10.00.

For the second, to Daniel Duer, of Millersburg, for 55 varieties, \$6.00.

For six best market varieties, to F. R. Palmer, of Mansfield, first premium, \$6.00.

For the second, to S. H. Hurst, of Chillicothe, \$4.00.

For five best varieties for family use, to Daniel Duer, of Millersburg, first premium, \$5.00.

For the second, to W. H. West, of Chillicothe, \$3.00.

For best three varieties dessert apples, to Daniel Duer, of Millersburg, first premium, \$3.00.

For the second, to S. H. Hurst, of Chillicothe, \$2.00.

PEARS.

For the best display of pears, to Leo Weltz & Sons, of Wilmington, first premium, \$6.00.

GRAPES.

For the best display and collection of grapes, to Jacob Linxweiler, Sr., of Dayton, first premium, \$5.00.

For the second, to E. H. Cushman, of Euclid, \$3.00.

POTATOES.

For the best and largest display, 23 varieties, to Rev. E. H. Otting, of Wadsworth, first premium, \$5.00.

For the second, to F. R. Palmer, of Mansfield, for 30 varieties, \$3.00.

The following are the lists of fruit, etc., exhibited, to which premiums were awarded, so far as the Secretary was able to procure them:

APPLES.

Hurst & Hurst's Collection.—First premium: Belleflower, Western Beauty, Sweet unknown, Rock Apple, Roxbury Russet, Kaign's Spitzenberg, Rome Beauty, Lowell, Hoopes, Ortle, Newtown Spitzenberg, Canon Pearmain, Peck's Pleasant, Evening Party, Lady Sweet, Wagener, Fink, Smith's Cider, Gloria Mundi, Baldwin, Stark, Smoke House, Paradise Winter Sweet, Red Cheek, Dodge's Crimson, Small Rambo, Small Romanite, Gravenstein, Sweet Rambo, Bachelor's Blush, Fallwater, Dutch Mignonne, Fall Wine, Rawle's Janet, Ben Davis, Cooper, Holland Pippin, New Seedling, Fall Butter, Maiden's Blush, King of Tompkins County, Jersey Black, Red Winter Pearmain, Swaar, Yellow Newtown, Dr. Warder, Lady, Red Rambo, Willow Twig, Black Gillflower, Sweet Russet, White Winter Pearmain, Winesap, Fameuse, Tallman Sweet, Pennock, Chillicothe, Westfield Seek-no-further, Rambo, Northern Spy, Fall P. ppin, Dominie, Late Strawberry, Seedling, Milam, Tampo, Michael Henry Pippin, Limber Twig, Ohio Nonpareil, American Golden Russet, Western Spy, White Pippin, Nickajack, R. I. Greening, Jonathan, Worthless, Grimes' Golden, Ohio Beauty, Nasive Crab.—80 varieties, 101 plates.

F. R. Palmer's six best market varieties, first premium: Baldwin, Grimes' Golden, Jonathan, Northern Spy, Peck's Pleasant, Red Canada.

S. H. Hurst's second-best six market varieties, second premium: Ben Davis, Dominie, Rawles' Janet, Rome Beauty, White Pippin, Winesap.

Daniel Duer's five best varieties for family use, first premium: Baldwin, Grimes' Golden, Peck's Pleasant, Rambo, Smith's Cider.

Wm. H. West's second-best five for family use, second premium: Rambo, Rome Beauty, Smith's Cider, Smoke House, White Pippin.

Daniel Duer's best three varieties dessert apples, first premium: Belmont, Canada Red, Grimes' Golden.

S. H. Hurst's second-best three varieties for dessert, second premium: Grimes' Golden, Northern Spy, Winesap.

POTATOES.

E. H. Otting's best and largest display, first premium: Belle, Burbank, Chicago Market, Clark's No. 1, Dakota Red, Early Beauty of Hebron, Early Ohio, Early Pearl, Early Sunrise, Garfield, Green Mountain, Jones' Prize-taker, Late Rose, Lee's Favorite, O.K., Mammoth Prolific, Perfect Gem, Pride of America, Queen of the Valley, Red Star, State of Maine, Watson's Seedling, White Elephant, White Star.

Very creditable, and some handsome exhibits of apples, were also made by Messrs. J. B. Mitchell, of Grove City, N. W. Julian, of Circleville, and Nelson Cox, of Bradrick. The following special report was made upon a part of Mr. Cox's exhibit:

Two plates of apples from Nelson Cox, each represented to be new seedlings. As we see them, quite promising in both size and appearance, though quality not so high as we would desire. We would recommend them for further trial.

GEO. W. TROWBRIDGE,
For the Committee.

PEARS.

F. C. Miller, of New Philadelphia, exhibited very fine Winter Nelis pears. Commended.

GEO. W. TROWBRIDGE, of Glendale, exhibited very fine Duchess—winter pear, Chromatelle, an old variety, valuable for culinary use, Mahoning, a seedling introduced from Mahoning county, fine in appearance, and better than Kiefer.

The Committee were also very much interested in a collection of Russian apples, brought direct from Russia, under great difficulties, by Leo Weltz. Notwithstanding their long journey, a number of them presented quite a good appearance, and gave the committee some idea of Russian fruits. From the general information received from Leo Weltz, the committee would caution the public not to purchase too freely, or indiscriminately of these Russian fruits, many of which may prove worthless for this region; but wait until they are tested and report made to our Government upon their character.

Some very fine Celery shown by Mr. F. C. Miller, of New Philadelphia, and M. Witt, of Columbus, and Salsify also, by Mr. Witt, were highly commended.

A Hubbard Squash, weighing $37\frac{1}{2}$ pounds, exhibited by J. R. Hurst, was regarded as a very fine specimen, highly creditable to the producer.

LEO WELTZ,
JOHN POSTE,
N. H. ALBAUGH.

Upon motion, the report of the committee was accepted and placed on file.

President Ohmer then opened the question-box, and announced the following question: Has any one present had experience with the Downing Mulberry?

Mr. Farnsworth.—I have raised it for a number of years, and find it perfectly hardy. The main crop is through August. The fruit is about the size of the Snyder blackberry, and a little different in shape. I think the fruit desirable, and the tree is ornamental and very productive.

Mr. Harrison says the Downing mulberry is not as hardy as the American.

Mr. Weltz also recommended the American.

Upon motion, the Society then adjourned until seven o'clock p m.

EVENING SESSION, December 3, 1885, 7 P.M.

The Society was called to order, by the President, promptly at 7 o'clock.

President Ohmer.—The first thing in order, this evening, is the discussion of the question of a summer meeting. Are we to have a summer meeting? Shall we decide where to go? Shall we receive invitations? I have understood that there is a gentleman here who will invite us if we want to go. Shall we take up the question? Will you have a summer meeting?

Mr. Trowbridge.—What is the object of a summer meeting?

President.—For the purpose of observation—visiting berry-patches in fruit-growing localities where there is most to be seen; and one evening we will meet in a hall and discuss what we have observed during the day, and the next morning visit again, and then go home. This Society, at one time, had these summer meetings each year, and other State societies also hold them regularly.

Mr. Trowbridge.—You have an Ad Interim Committee to examine and visit and make reports to the Society. What is the use of the meeting?

Secretary Campbell.—It is competent for the officers of the Society to call a meeting at any time, I believe.

President Ohmer.—There was no meeting last year, because there was no effort made to get one. I believe Michigan meets four times a year.

Mr. Cushman.—I think it is advisable to have a meeting of the Society at the time of the year when berries are in their season. It would be a meeting that would carry the matter out into the fields when everything is in the most active condition, and we could observe fruits of all kinds. I move that we receive invitations for such a meeting, and that we hold one.

Mr. Trowbridge.—You have what you call a summer meeting here in September, at the time of the State Fair.

President.—We want to go out into the fields and orchards where fruits are growing. We only look at the fruits upon tables here.

Mr. Cushman.—The reason why I am in favor of this meeting is, that Mich-

igan has a more interesting meeting at that season of the year than at any other. They have valuable papers read, and very interesting meetings.

The question was then put, and carried.

President Ohmer.—We are ready to receive invitations. We shall expect to have conveyances from plantation to plantation. We do not expect you to pay our hotel bills, but we expect you to show us what courtesies you can, and show us whatever you have of interest.

Mr. Stanton, of Barnesville, in behalf of their very active local society, invited the Society to meet at Barnesville during the strawberry season.

It was moved that the invitation be accepted.

Mr. Cushman.—I think the time should be arranged by the Executive Committee.

Mr. Albaugh.—It occurs to me that the National Association of Nurserymen meets at Washington in June. Care must be taken that the dates do not conflict.

Mr. Stanton.—The berries will be in their prime before this convention is held.

The question was then put and carried.

Secretary Campbell.—There is a proposition I would like to make. One of our oldest and most honored members is not able to be present with us at this time, and I feel that I would like to have him made an honorary member of this society for life. I refer to Mr. G. F. Newton. I move that he be made an honorary member of this Society.

This was carried unanimously.

Mr. Daniel Duer.—In behalf of my father, I thank you for the honor bestowed.

President Ohmer announced the question: What methods have been most successful in protecting apples and apple trees from insect enemies? Have any members experimented with liquid poisons for that purpose; if so, with what success?

Secretary.—Gentlemen, this is a subject which I regard as important, but I have not much practical knowledge of it. At the meeting of the American Pomological Society at Grand Rapids, it was reported that the spraying of liquid poisons upon the orchard trees had been very successful, not only for destroying worms, but that it had protected the fruit from various insect enemies. Mr. Moody, of New York, spoke on that subject, and he used London Purple. He had some kind of an arrangement by which he drove his wagon through the orchard, the wheels of which worked a self-acting pump, which cast a spray over the trees; and he spoke of it as remarkably successful. All who had experimented with it are satisfied with the results as very beneficial.

Mr. Harrison spoke of a friend who was also very successful. He said—I asked him how they did it, and he said they sprayed with London Purple. The attachment they had to the wheel was the best and cheapest. It was a pump that would throw twice the amount required, and it was so arranged that one stream was going back into the cask all the time, keeping it stirred up; the other was cast in a spray over the trees. They soaked their purple in water over night.

Mr. Palmer.—What is the cost? Is it more practical than sacking, for grapes?

Mr. Aldrich.—I tried this spraying with London Purple. I used a large, heaping-teaspoonful of purple and three gallons of water to each tree. I think it helped them some, from the first crop of worms, but I did not repeat the spraying. I think that if this is to be effectual, it will have to be applied more than once. Once is not effectual. The cost is not a quarter of a cent a tree.

Mr. Trowbridge.—I have experimented, for two years past, upon some Benoni apple trees in my yard. Two years ago, I tried Paris Green; last year, London Purple. I applied it in one case twice, and in the other case three times.

President Ohmer.—What time did you apply it?

Mr. Trowbridge.—As soon as the blossoms were off. It had no effect upon the curculio, but, as far as the codling moth is concerned, it is perfectly effectual.

President Ohmer.—I was very much interested in the discussion at Grand Rapids, and I wrote a letter to Mr. Moody in regard to the manner he has his pump to work. He attaches a cog to the wheel of his wagon. He has one man to work the pump, and one man to drive. He drives through the orchard and sprays one side of the trees, and then drives back and sprays the other side. He is going to have a machine made that will cost twenty dollars. He uses one pound of the London Purple to two hundred gallons of water. He puts it into the water a day or two before using, and lets it thoroughly dissolve, and it can be well mixed when in motion. He is very positive that he has saved his fruit by this application. He applies it first when the trees are about going out of bloom, and then, two or three weeks after, he gives them another spraying. There were others who approved of it, and they did not fear the codling moth. Like Mr. Trowbridge, I think it will not affect the curculio.

Mr. Duer.—Will it not injure the man who applies it?

President.—Put on an old overcoat and an old hat, and shut your eyes, and there is not much danger.

Mr. Weltz.—In passing through the different countries, I found a great deal of complaint about this codling moth. In Germany and Russia, the government has made great efforts to destroy it. I asked the professors of the different institutions about the remedy, and they gave it to me very freely. He has a recipe which he saw used in Dresden and Moscow with success, and he will translate it and give it to the Secretary for publication. He says he also has a remedy for the red louse, aphids.

The President then called for a paper by Prof. Townshend, of the State University, on "Obnoxious Plants," which was read:

OBNOXIOUS PLANTS.

By DR. N. S. TOWNSHEND, O. S. U.

Mr. President:

Life is a battle; while we strive for the true, the beautiful, and the good, with equal earnestness we must contend against their opposites. So mixed are things in the world, that we rarely find the good without having reason to fear that evil may be in the vicinity. Hence we cannot abandon ourselves to the enjoyment or contemplation of what is good, but must continually keep watch against the evil that may be ready to intrude. As in the wide world, so with the special domain of each individual; neither golden grain, luscious fruits, nor fragrant flowers, must so engross our attention as to cause us to forget that plants of opposite character are ever ready to spring up, to the injury of ourselves, our animals, or of the crops we cultivate; and therefore, while we bestow labor and care upon plants that are desirable, we must ever be ready with spade or hoe, to eradicate such as are obnoxious.

May I ask your attention to a few of these obnoxious plants by name; to many others, our limited time will permit me to refer only in groups.

1. POISON IVY. For the moment, this name may stand for two or three species, *Rhus venenata*, *Rhus toxicodendron*, and *Rhus radicans*, all of which are found in our State, and are all poisonous. These plants do not affect all persons to the same extent; not only individuals, but sometimes whole families are found to be insusceptible to their poison. A majority of persons, however, cannot touch either of these

species, nor even come within range of their gaseous emanations, without injury in the form of a painful erysipelas; and persons not usually affected, will feel the poisonous influence to some extent, if brought in contact with the Ivy, when in a free perspiration. The Ivy sometimes proves destructive to fruit trees; but whether, by its close embrace, it interferes with the circulation of their sap, or by its poisonous properties, perhaps is not known. The Rhus is sometimes used in medicine, but this cannot be accepted as a reason for its general toleration. In every neighborhood, if not upon every farm, some person may be found who can handle this pest with impunity; then what can be more desirable than to secure the help of such persons, until it is thoroughly eradicated.

2. NETTLES. *Urtica dioica* and *Urtica urens*, and perhaps one or two other species of Nettles are found in Ohio. The effect of the sting of the nettle is probably felt by every one whose skin is thin enough to be pierced by the hairs upon its leaves; it is especially severe upon children, most of whom, from painful experience, are compelled to learn its venomous properties. The young shoots of nettles make palatable greens in the Spring, and the fibre of the stem, like that of hemp or flax, may be spun, and woven into cloth, or twisted into cordage; but as Tusser said, more than three hundred years ago, "Nettles, though no. wholly useless, are seldom applied to any good purpose, but remain a stigma on the industry of the farmer who suffers any part of his land to be overrun by them."

3. THISTLES. *Cirsium arvense*, *Cirsium horridulum*, *Cirsium lanceolatum*, *Cirsium pumilum*, and six or seven other species, are found in different parts of the country. In pastures, meadows, and grain fields, the thistle is a notorious pest. Its seeds have a feathery pappus, so that the winds distribute them widely, and the spines of the receptacle attach bunches of seeds to the hair and wool of animals, who then further aid in their distribution. That thistles, if cut early and thoroughly bruised, are relished as food by some kinds of stock, would be no reason for suffering them to grow, while the labor necessary to make them edible, is so rarely bestowed. Tusser says, that "thistles generally indicate good soil, though they are never suffered to grow upon any well managed farm, and even by the roadsides, they should be prevented from seeding." Darlington, in his "American Weeds and Useful Plants," says of the Canada thistle, *Cirsium arvense*, "This is the most execrable weed that has yet invaded the farms of our country." Linnaeus says that he bestowed on this plant the name of *Cursed Thistle*, with a view to awaken the attention of agriculturists to its pernicious effects. I regret to add, that from my own observation, I am compelled to believe that the Canada thistle is rapidly gaining a foothold in our State.

4. BURS. Of these pests there are many species; of the common burdock, *Lappa major*, Darlington says, "Every body knows this coarse, homely weed, wherever it has gained admittance, but everybody does not take care to keep it in due subjection. One of the earliest and sure evidences of slovenly negligence about a farm-yard, is the prevalence of huge burdocks." Of hound's-tongue, or beggar-ticks, *Cynoglossum officinale*, Darlington says, "The slovenly farmer is apt to get a practical acquaintance with this obnoxious weed, in consequence of its racemes of bur-like fruit entangling the manes of his horses and the fleeces of his sheep." Of Spanish needles, *Bidens bipinnata*, and five or six other species, Darlington says, "All the species here enumerated are worthless, and particularly disagreeable on account of their barbed awns, which cause the seed to adhere in great numbers to clothing." The Clot-bur, or Cockle-bur, *Xanthium strumarium*, according to the authority so often quoted, is an obnoxious weed, though not much inclined to spread, so that with a little attention, it is easily kept in subjection; the burs are a great annoyance in the fleeces of sheep. CLEAVERS.—*Galium aparine*, and nearly a dozen other species; some of them are said to be insignificant, even as weeds, while others have seeds armed with hooked prickles, which adhere to everything that comes in their way. TEASELS, *Dipsacus sylvestris*.—The Fuller's Teasel, *Dipsacus fullonum*, subserves a useful purpose in the city but of the wild Teasel, Darlington says, "This coarse plant is completely naturalized in some localities. It is not only useless, but threatens to become a nuisance to the farmer, if not attended to."

5. POISONOUS PLANTS. Growing wild within the State are several poisonous plants, which may injure stock, and some, which, directly or indirectly, may harm the people. Among them is the Tremble-weed, *Eupatorium ageratoides*, which is still found in some localities. In addition to the animals it destroys, it so affects the milk of cows as to cause the disease known as milk-sickness, in persons who use the milk. When Ohio was first settled, and for many years after, this weed was common, but as it is rarely found except in woods, it is now much less prevalent; still, we occasionally hear of animals poisoned, and of people affected by its agency.

Perhaps better known are Sheep's Laurel, Cowbane or Wild Parsnip, Henbane, Deadly Nightshade, Fool's Parsley, Monkshood, Hellebore, Veratrum, Poison Hemlock, and Stramonium. Many of these are used as medicines, but since physicians do not depend upon waysides for their drugs, there is no reason for allowing these plants to grow where only mischief can result. To conclude this reference to poisonous plants, may we express the hope, that the time will come, when the people of Ohio will be so well satisfied with the enjoyment of delicious fruits and fragrant flowers, as to refrain from the cultivation and use of tobacco, which many of us regard as the vilest weed with which the earth is cursed.

6. WEEDS. A weed has been defined to be a plant out of place, or one that grows where it is not wanted. The great multitude of plants embraced by these definitions, we shall not have time to enumerate. Some of them are more objectionable than others, some are worse in particular sections, owing to peculiarities of soil or climate. Unless kept in subjection, weeds are capable of doing immense injury to farm and garden crops; and no good cultivator of a farm or garden will rest satisfied to have them bear testimony to his want of care. The botany of weeds may be less attractive to many than that of useful plants, or flowers; but a thorough knowledge of all obnoxious plants, it is believed, would prove a powerful incentive to their destruction. The report of the Ohio Experiment Station for 1884, contains such full notice of our most troublesome weeds, as to render any special description of them here, unnecessary.

The General Assembly of Ohio, by an act passed February 14, 1884, to amend sections 4732 and 7001 of the Revised Statutes, has provided, that whenever the trustees of any township are notified in writing that Canada Thistles, Teasels, or Wild Carrots, are about to seed upon the land of any person, they shall immediately have them destroyed, and the law further provides for making the expense of such destruction chargeable upon the owners of the land.

Section 7001, as amended, makes it a penal offense to sell grass seed, or seed of any description, which is mixed with the seed of Canada Thistle, White or Yellow Daisy, or Wild Carrot. This section also imposes a fine upon any person who allows these weeds to seed upon his land, or on the adjoining highways. A supplementary act extends these provisions to cities of certain grades.

By these enactments, the State Legislature manifestly intended to protect the careful and thorough farmer from the negligence of others. Let us accept what the Legislature has done in this direction with thankfulness; and if in the future we find it desirable to have other plants added to the list, as doubtless we shall, or to secure other changes, we may with confidence ask for such amendments.

An important question now arises: How can we in the best manner, aid the authorities in carrying the law for the destruction of obnoxious weeds, into effect? We shall, of course, take it for granted that the State Horticultural Society is thoroughly in earnest upon this subject, and will be ready to participate in any measures, such as the law prescribes. Perhaps we may be permitted to suggest that every County Agricultural Society be invited to take prompt action and call the attention of its members in the several townships, to the legislative provisions now in force. Also that our Granges all over the State, take up the subject, study the law thoroughly, and also the character of all our obnoxious plants, and determine the best means for their destruction. Then let every Farmers' Club, and every local Horticultural Society unite in the good work, so that in the near future, by diligence and faithfulness, we may banish all obnoxious plants from the State, as ultimately we hope to conquer all other evils.

Mr. Palmer asks if the Doctor is satisfied as to the weed that causes milk sickness.

Dr. Townshend.—Yes, sir; when I find this disease among cattle, I find that weed in the adjoining woods, or somewhere where they have found it, so that I have never found it without finding this weed. And then I take the opinion of the people. This weed is commonly called tremble-weed. Experiments have been tried by giving this weed to cattle, and the results named have been produced.

Mr. Palmer thinks it is caused by the drinking-water, as much as anything. He knew of two families who lived close together. One family used cistern-water, and was perfectly healthy; while the other used well-water, and all had this milk sickness. He also told of a well near where he used to live. The

water looked a little like milk. After drinking this water he noticed that he felt badly. Some years after he left there, three of a family who used the water from that well, died of milk-sickness, and a number of the neighbors died, also.

Mr. Albaugh never heard of this sickness appearing in winter.

Mr. Cushman says that a great deal has been done in the way of scattering the Canada thistle by the railroads, and that from stock that has been unloaded in his town, the thistle has been brought in.

Mr. Newell also said that large amounts of Canada thistle had been left by trains along the lines of railroads.

Mr. Palmer says that speculators, too, who are holding their lands for high prices, are raising large amounts of these thistles. They do not cultivate their lands and pay no attention to them, and are raising acres of the Canada thistle near Toledo.

President Ohmer.—The Canada thistle is as far south as Dayton. I discovered it three years ago in a place not a quarter of a mile from my place, on the road side. I went to the authorities then, but failed to get it suppressed. This paper reminds me of the matter, and I am going to attempt it again. I have a little on my place, and every year I see more or less of it. I have been fighting it, and I am going to persevere. I shall also see that the Canada thistle on the public road is attended to. It is, no doubt, farther south than Dayton. It is no easy thing to fight it.

Mr. B. F. Albaugh.—During the lectures at the University, it was stated that the Canada thistle does not perfect its seeds south of the fortieth degree.

Mr. Green.—There are several patches of the Canada thistle around the University, and Mr. Devol and myself have examined it carefully, and never found a seed. I would like to know if it perfects seeds.

Mr. Trowbridge.—I found some of the thistle on my place. I got it from clover-seed which I sowed. I kept cutting it off for a few years with a hoe, but it sprouted again. The last year, I took a knife and cut it off below the ground and put salt on it, which killed it.

Mr. N. H. Albaugh.—I have had some experience with the Canada thistle. We cut them down every year, but they stay with us. I have never seen any seed.

Mr. Snider wants to know how it looks.

Mr. Farnsworth.—We find the thistle in our sandy loam not nearly so bad as in heavy soil. Along the river, where the soil is quite heavy, it forms in perfect masses of foliage. In our sandy-loam soil, we occasionally see a little, but can destroy it all.

Mr. Albaugh says he will explain to Mr. Snider how it looks. It comes from the roots. It is somewhat smaller than the common thistle. The leaves are cut in scallops. The flowers are a little bluer than the other. It comes to stay, and does stay.

Mr. Weltz.—Probably I can help Mr. Snider. In the old country, especially in Germany, when the potato-bug was so bad here in America, for fear the potato-bug should appear there, they taught all the children how it looked. In every school they made a big picture of it, so that every child would know how the bug looked—so that they would know it when it came. I would say, let us have a big picture of this thistle put in every school-house, and mark underneath, "Canada Thistle," and teach them how to destroy this thistle. It was always a great pest in Europe. Wherever they find it, and they can not get rid of it in the third year, they sow what is called rape. This grows so wonderfully fast that it kills the thistle. This operation is repeated two years.

It grows very strong, and is an enemy to the thistle. In this way they destroy the thistle.

Mr. Albaugh.—I don't think we need flatter ourselves, even if it does not seed here. If you cut a root in two, you have two plants. A subdivision of the root propagates it so rapidly that every little piece makes a new plant. Northern Indiana is troubled with it a good deal.

President Ohmer then called for a consideration of the seedling fruit on the table.

Mr. Weltz asks the assistance of pomologists in considering this new fruit. The Leanover and Tampo apples were presented by W. H. West.

The President announces the following from the question-box: "In planting a quince-orchard, will it pay to plant a row of currants between the quince trees?"

President.—I planted a quince-orchard of four hundred and eighty trees among my raspberries, and in cultivating the raspberries, I cultivated the quinces. Of the four hundred and eighty I planted, I lost none.

Mr. Miller.—Did you protect the roots in winter?

Answer.—I mulched the ground. I have a great quantity of white-pine needles. I put three or four inches around the trees. I have some coal-ashes that I mean to put around the trees this fall. You want to keep the roots well protected from the cold. It is the nature of the roots of a quince tree to be near the surface; therefore they need protection.

The President then announced a second question from the box: In manuring a piece of ground for strawberries, which is best, to plow the manure under, or top dress it after it is plowed?

Mr. Farnsworth.—I would top-dress, if the manure is sufficiently decomposed. If top-dressed, it will work down by the rain.

Mr. N. H. Albaugh.—On account of the weeds, top-dressing is dangerous. For that reason, I would plow under.

President Ohmer.—I top-dressed a strawberry patch of four or five acres with manure a few years ago, and I had more weeds than berries the following year.

Mr. Farnsworth.—I have found the same difficulty. I would apply the manure to the preceding crop. It pays for the extra labor in keeping clean.

Mr. Palmer says that Nature puts the manure on top. In his neighborhood, farmers are getting to put the manure on after harrowing in wheat, etc.

President.—Will it do for strawberries as well as wheat, etc.?

Mr. Cushman.—The best top-dressing that I ever used for strawberries, was forest leaves, placed on in the fall and during the winter. In the spring, the strawberries came right up through. We find it a pretty good fertilizer, and keeps the ground clean. I would prefer to plough manure under.

Mr. F. G. Miller.—We use a home made fertilizer. We mix one ton of hen manure, four hundred pounds of land plaster, four hundred pounds bone meal, and fourteen hundred pounds of road dust. To mix them, we take a sand screen and put in this fertilizer and rub it through and get it thoroughly fine and well mixed. We get two tons at an expense of twelve or fifteen dollars. This is a good amount per acre. We put this on top and harrow it in. It is good for any other growing crop.

Prof. Lazenby then announced that the ladies were waiting for the Society to attend the banquet which they have prepared in the room above, and upon motion, the Society adjourned the session until nine o'clock on Friday morning.

This banquet, so gracefully and hospitably tendered the Ohio State Horticultural Society, by the Columbus Horticultural Society, and which was pre-

sided over by the lady members of the latter Society, was a most elegant affair, and the Secretary confesses himself quite unable to do justice to the subject.

Four long tables in the City Hall were tastefully decorated with fruits and flowers, as well as the more substantial delicacies of the season. Three hundred or more guests were seated, and the orchestra rendered some delightful music during the entertainment. Professor W. R. Lazenby called upon the gentlemen named to respond to announcements as follows :

The Ohio State Horticultural Society—President N. Ohmer, of Dayton.

The Relation of Horticulture to Agriculture—Sec. W. L. Chamberlain, of the State Board of Agriculture.

The American Horticulturist Abroad—Hon. Leo Weltz, of Wilmington.

The Relation of Horticulture to the Fine Arts—L. B. Pierce, of Tallmadge.

The Relation of Horticulture to Higher Education—President W. H. Scott, of Columbus.

The Relation of Horticulture to the Education of the Young—Prof. F. G. Cary, of Cincinnati.

The Horticulturist in Politics—Hon. N. H. Albaugh, of Tadmor.

Many of the citizens of Columbus, and the professors of the Ohio State University, were among the guests of the Columbus Horticultural Society, and all pronounced it one of the most enjoyable and elegant receptions ever tendered the State Society.

FRIDAY MORNING, 9 o'clock, December 4th, 1885.

The Society was called to order at nine o'clock by the President.

President Ohmer.—I have a resolution handed me by Mr. R. H. Warder, upon Forestry, as he cannot remain with us but a short time.

The Secretary then read the following resolution, which, after a little discussion, was unanimously adopted :

Resolved, That the Ohio State Horticultural Society realizes the vital importance of Forestry to the State at large, and to all horticulturists. And we, therefore, urge the Legislature to take prompt action, aiding the work of the Forestry Bureau, and especially ask for the immediate establishment of Forestry Experiment Stations in Ohio.

The Secretary announced the following telegram from the Michigan State Horticultural Society :

Ohio State Horticultural Society :

The Michigan State Horticultural Society returns your greeting, with interest.

Mr. Campbell called attention to Mr. H. G. Tryon's resolution to change the time for holding the annual meetings. He proposed having the time fixed for the first Wednesday after the first Monday in January.

Mr. Warder said the Indiana Society had its time fixed by its charter, for the first week in December.

The President is opposed to the first week in December ; the second week would be his choice.

Mr. Albaugh says that there are a good many associations meeting the first week in January, and some of them are of interest to the members of this Society. He moves that the second week in December be adopted as the time for the annual meeting of this Society.

President.—Cannot the time be fixed ?

The Secretary stated that Mr. Tryon wished the time to be fixed by amending the Constitution, as follows:

Geo. W. Campbell, Secretary Ohio State Horticultural Society:

DEAR SIR: Believing that a later date for the annual meeting of the Society will better accommodate fruit-growers who do a general farming business, I beg leave to offer the following amendment to the Constitution:

In the ninth section, strike out all to the first period, and insert:

9h. The Annual Meeting of the Society shall open on the first Wednesday after the first Monday in January of each year, at such place as may be designated by a vote of the Society, notice of the time and place, together with the order of exercises, to be sent in due time to each member by the Secretary.

Mr. Albaugh asks if the constitution can be amended at one meeting of the Society, or whether it has to go over to a second meeting.

Secretary states that it can be amended by a two-thirds vote of the members present, at any regular meeting.

Mr. Albaugh moved the adoption of Mr. Tryon's amendment to the Constitution, leaving the time for the meetings to be determined afterward.

Secretary.—If we adopt the resolution, we adopt the time also.

Mr. Warder.—I move that the resolution of Mr. Tryon be amended by the insertion of the second week in December, instead of the first in January.

After some further discussion of the resolution, it was adopted, after amending it, by inserting "the second Wednesday after the first Monday in December," in place of the first Wednesday after the first Monday in January, and the Constitution was amended accordingly.

Mr. Farnsworth.—I have been requested by some of the exhibitors at the State Fair, to bring a matter before this Society regarding the violation of the rule that exhibitors must grow their own fruit. They claim that some have collected fruit from other growers, and exhibited it as their own.

President Ohmer.—This is not a matter for our consideration. It belongs to the State Board of Agriculture. I do not know that we can do anything about it.

Mr. Farnsworth.—The request is that our Society recommend some penalty for the violation of the rule requiring exhibitors to grow their own fruit.

Mr. Albaugh.—We can recommend to the State Board to fix such penalty.

Secretary Campbell.—My impression is that there is such a rule now in force, adopted by the State Board, requiring that the fruit shall be grown by the party exhibiting it.

Mr. Palmer.—I personally know that it is violated.

President Ohmer.—The proposition then is, to suggest to the State Board a penalty for those who violate this rule. What penalty would you have?

Mr. H. C. Noble.—Exclusion from receiving premiums.

The Secretary suggested that it be put in writing, in the shape of a resolution, by Mr. Farnsworth.

Mr. Palmer says he knows that many honest growers are kept from exhibiting, by those who go around the country collecting fruit to be exhibited, as of their own growing.

Mr. Noble suggested that if the premiums were refused, the names and reasons be published.

President thinks it would be sufficient punishment to be refused the premiums.

The question was finally dropped without taking any further action upon it.

President Ohmer announced for discussion the question: Root-grafting; is it a cause of unhealthiness in apple trees? Are budded trees better than those that are root grafted?

Mr. Albaugh.—As I understand it, this question means root-grafting as or-

dinarily practiced, what we nurserymen call piece grafting—grafting apple trees on pieces of roots. I will say that I have spent a good deal of time in the last few years investigating this subject, not only in Ohio, but in New York. I spent two days with Mr. Moody, who has been mentioned here. He has been in the nursery business since 1839. He has discarded piece-root-grafting. He does some budding and a great deal of crown grafting. The difference between crown grafting and root-grafting, is in using a piece of a root to make the foundation of a tree in place of a whole root. Mr. Moody said to me, as we were riding along through western New York, "Now, this is an orchard grown on whole roots; and there is an orchard grown on pieces of roots." I asked him how he could tell, and he said he knew of part of them; but he could tell any orchard, whether they were whole roots or pieces of roots, from the shape of the trees. I am firmly of the opinion, that to produce apple trees from pieces of roots is not the best way, either for the nurserymen or for the orchardists. I have been in the nursery business twenty-seven years, and my judgment is, that I would give a great deal more for apple trees grown on whole roots, than on pieces of roots. It is often true, that good orchards are grown on pieces of roots, but that does not change the actual fact in the case. If it is the natural method for apple trees to form and reproduce themselves from cuttings, or slips, or layers, as currants, then I say graft on pieces of root half an inch long, or without any root at all, and upon cuttings. That is not the natural method, and not one person in ten practises it. It is true, a few kinds of apples seem to be more ready to throw out their own roots than some other kinds. The fact of it is, that a piece root-graft of a tree put into the ground, is only an assisted cutting. It is a cutting assisted with a small piece of root. If any one can show me whereby the seedling has any chance to develop its original formation in the root and top, I am willing to say it don't make any difference how you graft it. What is called crown-grafting, is planting the graft not so deep in the ground, and depending upon the seedling to make the graft perform its duty. When I speak of crown-grafting, I take in the whole subject of budding. It is on the same principle. I do believe, from what I see in the nursery, and after the experience I have had, that budded trees, or crown-grafted, as you please, it is all the same thing, grown from whole seedlings, make, generally, very much better trees, than those grown upon pieces of roots. There is no possible doubt of it. The trees grown on whole roots have twice as many roots as the others. I will say right here, that there is no good reason why they should ever have been grown from piece roots. I believe that the practice began in a false notion of economy. No man ever saved a dollar by that process. It never paid a nurserymen, to cut up his roots. Mr. Moody, when I was with him, showed me a piece of ground where he had put eighty four thousand crown grafts, four years ago. After three years, they dug the lot, and he said to me, "How many do you suppose we dug out of that lot of eighty-four thousand crown-grafts?" I guessed sixty thousand. "Our books show a digging of a little over eighty thousand out of that lot of eighty four thousand." It pays us, in all kinds of stock, to use the best. I have just got an importation from France, and I bought the very best. I generally found when I used to retail trees, that patrons would look after the thriftiest trees they could get; and when they found one that was not thrifty, they did not want it at any price. We want the best trees we can get; and the best trees are certainly not grown on pieces of roots. I do not say because we use the whole seedling, it necessarily makes the tree hardier. But to make a tree hardy, you want all the vitality you can possibly get into it, and all the root you can get to sustain it.

Mr. Frowbridge.—This is a subject that is quite near to my heart. I wish

to say that Nature has designed but one true mode of propagating a tree, in its individuality, and that is from the seed. I want you to understand and look at it in this light. If we can understand it thoroughly in that way, we will probably be on the road to putting the matter on a more scientific basis. We look around us in nature. We see individuality on every hand. We see specific individuality. We look in the heavens. We see it in the planets. We come down to the human family. Is there not a specific individuality in each one of us. It is an all-wise provision of our God and Nature. It is a combination of characteristics. We come down to the animal kingdom. We see it cropping out, not so specifically as we do with individuals. When we look at trees and plants in the same light, we will be on the road, I think, to a more scientific mode of dealing with this matter. New fruit—how is it produced? Some bird, perhaps, has carried the seed, and the seed has dropped, and grown up. Some man, a horticulturist, says, "I will let it stand, and see what it will come to." It grows up in a few years and bears fruit. He examines the fruit. It looks well. He tastes it. It tastes well. There is a new variety, then. It is a specific individual. It has an individuality. It is a variety of that species. Is not that the plan by which all of our fruit has been produced? It is not all due to accident. If the fruit has a quality that we are looking for, it is given a name, and it becomes a distinct individual of that species, like a Grimes' Golden, or Bartlett. There it stands as a specific individual fruit, among the pear, apple, or other species. If it is ahead of anything we have, it is worthy of introduction, and we consider it a grand success. What shall we do in propagating it? Should not our highest aim be to reproduce it in its original individuality, and so retain it? Certainly it should. Is our mode of propagating in accordance with that idea? In growing a great many varieties of fruit in the same orchard, we cannot rely upon propagating from seed, to have that individuality retained, because cross-fertilization takes place. We know definitely, that in that process there will be a changed condition in the seed. We know it will not be the same variety, because the air carries the pollen of other species to fertilize that seed. If we have a tree by itself, where no other tree of its kind is near, we can take the seed and grow it, and be pretty certain of getting the same variety. We must look at it in just that light, exactly. If that fruit is worthy of being introduced and propagated, it is worthy to be propagated as it originally grew. If I can show that our method of propagation will tend to vary either fruit or tree, in one instance, I show that ours is not the best way. We propagate by means of budding and of grafting. In ninety-nine cases out of a hundred, an ordinary observer would not observe any difference. If there are any occasional differences, certainly the specific individuality of that species is being destroyed. Mr. Beebe has a sample of an apple. He grafted a Westfield Seek-no-further, and it produced the apple we had under examination last night. It produced a variety that is no more like the Seek-no-further than day is to night. Take the case cited in your own report. These are only occasional cases, but when I come to look at it, it is not unusual at all. If the sap that circulates in the tree, is analogous to the blood that circulates in the human body, we can see why these differences crop out. On my place, I can see a difference in the growth of trees, and variations in the fruit. I have three Seckel pear trees growing on my place. One tree shows a little variation from the rest, every year, in the fruit; and in the growth of the tree itself, I can see a marked difference. If the individuality were perfectly fixed, there should be no variation whatever in the growth of those trees. Though we may not see it in the fruit, yet we can often see a great deal of difference in the growth of the trees. I say there should be no difference. Where the individuality is kept up by propagation,

there should be the identical growth in every case. Nature is true to itself, in every instance. We should undertake to devise some way, that when a new variety is introduced that is worthy of propagation, we might propagate it in its identical and perfect individuality.

President Ohmer.—How can you best accomplish that?

Mr. Trowbridge.—I have not got that far along. I am not arguing on that question now. I want to get horticulturists to see and understand, that there is a specific individuality in every variety of a species that is introduced. If they will get thoroughly in earnest in the matter, we shall find out the way. With our thoughts in this direction, I have no doubt but what in time a way will be provided. I am glad to get the horticulturists to look at this matter. So far as the small fruit is concerned, there is a way. Whenever we propagate from a cutting of currant, specific individuality cannot be changed. It has no other root, except of that variety. At the same time, every cut we make, every move we make from the original plant, is a weakening process. Every time you put a knife to a tree, it is a weakening process.

Mr. Pierce.—How long before the Red Dutch Currant will be so weakened as to be worthless?

Mr. Harrison.—In regard to piece-root grafting, I don't know as I notice any particular difference; but it certainly produces a tree with a limited amount of root. We never practice piece-root grafting. In case we have an exceptionally good seedling, we sometimes make two grafts of the root. It has always been our rule to use a short cion graft at the collar, and a long root. We have sometimes put one graft on the collar, and one on a second piece, or tap-root, and we never could see any difference in the trees. On an average, I think, since we have been in the business, we have made a hundred and twenty five thousand grafts from a hundred thousand seedlings. In budding, we make the seedling a little longer than when we use the collar graft. We find the roots are heavier and better than with the collar graft. To preserve the individuality perfect, we should not put it on any root but its own, as we do in the Red Dutch Currant.

Mr. Wm. Longstreth.—I do not wish to change the train of thought on this subject, but would ask if a long continuance of propagation from cuttings, as we do in the grape, currant, etc., does not tend to weaken the power of that plant to produce healthy seed? Is not that the reason that the potatoes and strawberries run out? Does propagation from cuttings for a long series of years, destroy the power to produce good, strong, healthy, seed? Is that so, or not?

Secretary would say, not.

Mr. F. C. Miller. Nineteen years ago, I grafted fifty roots. Forty were grafted on pieces of roots, ten on the collar. The forty are dead. The ten are living and bearing good fruit.

Mr. Weltz would tell Mr. Albaugh that they had this subject up twenty years ago, and he will find an excellent report of it in our report. He is not in favor of importing apple-stocks from France. Why not import from Russia, instead, where the climate is more like our own?

Mr. Jenkins.—It seems to me it would be far better, according to Mr. Trowbridge's idea, to use as small a piece of root as possible, to induce the graft to throw out roots of its own. I know that can be done with a good many varieties of apples. Put in a very small piece of root to give them a start, and after that, the cuttings will make roots of their own.

Mr. Pierce.—Would you remove the piece of root?

Answer.—It might be best.

Mr. Pierce.—When Mr. Albaugh tells us certain trees have twice as heavy roots as other trees, until we have tried it for ourselves and proved it, we are

not convinced. When he tells us that Mr. Moody will ride through a great country, and tell what orchards were grafted upon pieces and what upon the collar, this is a great deal of fancy. In regard to trees not growing from cuttings all green house plants are grown from cuttings. The junction of a graft and root is formed at the collar. A cutting forms a callus at the base, and the callus produces the roots. I cannot see how mixing the sap makes any difference in the tree.

Mr. Trowbridge states that he has a row of Bartlett pear trees on his place. He propagated them in the nursery, and when he took them up, the pieces of roots upon which they were grafted, broke off, and they had thrown out new roots of their own. He says that in setting out a plantation of Bartlett pears, he would grow them all by the same process. They are somewhat between standards and dwarfs in character, compact and stocky, and different from those ordinarily grown. They are a sight to see. They are perfect patterns of one another, and bear every year, beautifully.

Mr. Poste.—I am very glad to hear this discussion, for it is of great importance. As regards the influence of the stock on the tree, there can be no doubt. Now, it seems to me, if we follow the logical course, if we wish to propagate the individual, we must reproduce it by cuttings, and this mode of reproduction would be the nearest possible, to the original. The root-graft is the nearest we come to getting this. If the stock has an influence on the tree, the stronger the graft and the shorter the stock, the better the tree, and the more nearly it comes to the original. A great many fruits, of course, are injured by the influence of the stock. When we have a budded tree upon a strong stock, we notice variations in the fruit of the whole tree. If we wish to exactly preserve the individuality of the tree, we should know the nature of the seedling and of the root. The Rambo seedling in a root-graft, will almost always leave a greater or less impression on the tree. I agree with Mr. Harrison as to the root. I do not think there is any advantage in planting a very long root, over a good, healthy one of proper size. At any rate, I have never found out a way to plant them nicely when they were too long. In planting a whole root, I find I am apt to get the tree more or less out of position. In transplanting, the long roots are apt to get more or less twisted. If the plan is to keep the individuality of the tree, the root-graft certainly must have the preference. I lay much more stress upon the effect of fertilization upon the quality of our fruit, than upon the influence of the stock, although both have their effect. If we wish to preserve the individuality of the tree, we should be very particular to graft upon such stock as will assimilate to the sort which is placed upon it. Therefore, I do not go very much upon so called select, hardy stocks for apples. Take two apples of very different kinds, or a pear and a quince. The imperfect union between the pear and the quince will make it short-lived.

Mr. Albaugh.—This discussion has taken a very wide range. The subject under discussion is Grafting as a cause of unhealthiness in fruit trees. Mr. Trowbridge's discussion has had scarcely any reference to this subject. The influence of the stock upon the graft, we have discussed very many times, but like the pig who went through the crooked log, we always come out on the same side of the fence. Do we, the horticulturists of this State, wish to say that the right way to raise apple trees is to raise them from cuttings, or, if not, to raise them from seed? We raise trees grafted upon seedlings, in all parts of the United States, and I have never heard that any are changed, to amount to anything. There is nothing in it worth discussing a minute before an intelligent society. There is not enough in it to make any difference at all. Some one has said in this discussion that you can raise plants from cuttings, in the green-house. That is a good way to raise grapes and gooseberries and currants, but it won't do for apples or other trees.

Mr. Pierce.—I can show Mr. Albaugh trees nearly a hundred feet high, of the silver poplar that were grown from cuttings.

Mr. Albaugh.—The question is, what is the best way to raise a tree. We want our report to recommend here whether a tree grown from a cutting of an apple tree, or a peach tree, or a pear tree, is just as good, or better, than one root-grafted. And if we, here in this Society, do not know, let us say so. Say to the State of Ohio, "We don't know." When Mr. Moody tells me that he is able to go through all western New York, and pick out the orchards that were grafted on pieces of roots, I will take his statement without exception, rather than that of a man who has not raised any trees, and has not had the experience that Mr. Moody has. As for me and my house, I do not propose to raise any apple trees in our nursery from cuttings. I practice what I preach.

Mr. Trowbridge.—I am sorry to see Mr. Albaugh throw cold water upon a matter I think so important. He says we are going round in the same old discussions we have had before. If the members would think of it, we might as well get out of that rut.

Mr. Harrison.—Two persons have spoken about trees dying, that were grafted on pieces of roots, and those that were top-grafted, or grafted on whole roots, surviving. If you graft upon a piece of a root, it may be so near the surface of the ground that the tree does not get sufficient support; those upon whole roots are planted deeper. Three or four years ago, we lost thousands of grape vines. Those vineyards where the Concord was deeply planted, survived, while those that were planted shallow, died. With us it is considered essential to plant deeply.

Mr. Janney.—In my limited knowledge, there is a question I wish to ask. The natural way to propagate is from the seed; and all trees have a natural method of growing. You take the tree naturally, and there are surface roots thrown out, upon which it may depend for its life. Suppose you graft a crown-graft. It has all those surface roots cut off. The graft is put in the tap roots. Will the nature of the tap root be changed so as to furnish any of those surface-roots, or not? I think not. The cion will send out some roots. One grafted upon a piece of root would be very much lacking in the necessary amount of root.

President Ohmer.—We have probably said as much as we ought upon this subject. The question is asked: Where the Baldwin fails, can it be made hardier by top-grafting? If so, what variety should be used?

Mr. Albaugh.—It is a well known fact in Wisconsin, that tender varieties can be made hardier by top grafting upon some hardier kinds.

President.—What variety?

Answer.—It makes no particular difference. Any hardy kind.

President Ohmer.—Gentlemen, we will now take up the resolutions. We will first take up the one offered by Mr. Farnsworth in regard to the exhibition at the State Fair of fruits not grown by the exhibitors.

After some little discussion, this resolution was laid upon the table.

The following resolution was offered by Vice President H. Y. Beebe:

Resolved, That there be appropriated from the funds of this Society, a sum not exceeding two hundred dollars, to assist the Ohio State Board of Agriculture, in defraying the expenses of lectures and essays on horticultural subjects, from members of this Society, at Farmers' Institutes in this State.

After some discussion, carried unanimously.

It was moved that all papers presented but not read, be put in the hands of the Secretary for publication, at his discretion.

The following resolution was offered by Mr. J. B. Mitchell, in regard to the statistics of fruits on assessors lists:

Resolved, That a committee, consisting of N. H. Albaugh and Dr. Townshend, be

appointed, to inquire if there is law authorizing the Assessors' blanks to include Strawberries, Raspberries, Blackberries, Currants, and Gooseberries, and if not, try to have the proper legislation, so that these fruits will appear in the yearly Agricultural Report of the State.

There was some discussion, but no definite action upon this resolution, the impression being that the matter would be provided for by the Society, in connection with the State Board of Agriculture, in a system of collecting fruit statistics in connection with the regular crop reports throughout the State.

The following Final Resolutions were then presented by Mr. L. B. Pierce, from the committee appointed on that subject; which were unanimously adopted:

FINAL RESOLUTIONS.

Resolved, That the thanks of the Ohio State Horticultural Society are hereby tendered to the following parties, who have contributed so largely to the interest and success of this Annual Meeting:

To the Columbus Horticultural Society for their cordial invitation to hold our meeting in the City of Columbus, and for the active and efficient aid they have rendered, and to the various committees of the ladies and gentlemen of the City, who have done so much for our entertainment and to render our meeting pleasant and profitable, in the way of a hearty reception, and the elegant banquet at the City Hall:

To the gentlemen and officers of the Ohio State University, for their very able and instructive addresses and papers furnished for this occasion:

To the members of the Board of Trade of the City of Columbus, who have so kindly permitted the use of their hall, for our meetings:

To the reporters and the Press of Columbus, for their interest in, and publication of our doings:

To the hotels of Columbus, who have kindly made reduced rates, and to railroads centering at Columbus, for reduced rates of fare in attending:

To the State Board of Agriculture, for their excursion to the new State Fair Grounds.

L. B. PIERCE,
Geo. W. TROWBRIDGE.

AD-INTERIM REPORTS.

AD-INTERIM REPORT FOR SOUTH-WESTERN OHIO.

By N. H. ALBAUGH, OF TADMOR.

The fruit-crop of the Miami Valley, for 1885, was better than for several years past, but not a full crop in all things. Peaches were killed by the severe winter. Cherries were a full crop in Early Richmond, and the Morello varieties generally, but not in the Hearts and Bigarreaus; in fact, these last are but sparingly planted in south-western Ohio. Some plums were grown where the jarring process was persevered in.

In pears, the crop was a very full one—the largest for many years, and in every way satisfactory, unless, possibly, in price, which was a little “off” in the beginning of the ripening season.

Though the Bartlett will doubtless long continue to be the leading variety in favor among orcharlists, yet they would do well to plant some of a late fall, or early winter variety. This year, the Vicar of Winkfield has done exceedingly well, and the flavor is quite satisfactory.

Of apples, there was a better crop than for several years past, but yet not a full crop. Summer and fall apples, generally, bore better than the winter varieties. The Red Astrachan is our earliest, reliable summer sort. Benoni, coming later, is much liked; also, Rambo was nearly a full crop this year. Planters generally ask for trees of hardy varieties, being tired, they say, of planting the tenderer sorts.

Apricots, of the old varieties, are generally too tender in the tree for our varying climate; but, within a few years, a large number of trees of Russian origin are being grown in the nurseries, which promise hope of a revolution in this superb fruit. The tree is hardy. The leaf and wood show a number of different varieties, though, as yet, these have not been definitely tested and named by any nurseryman or orchardist of reliability in our country, but are usually numbered, until such time as their several merits are more fully ascertained.

The Russian mulberry has been grown, to some extent, in the Miami Valley. The tree is perfectly hardy, and a rapid grower. It fruits very young, but the fruit on young trees is small and insignificant. We find, however, as the tree grows older the fruit increases in size. A tree on our grounds, of five years' growth, has borne fruit for three years past. The first year the fruit was no larger than large peas; the second year it was double the size, and this year it was greatly increased in size over last year—in fact, of fair size for picking and using; and we found they made excellent pies. The fruit is so sweet, and the little trees so literally loaded, that it invites the birds from far and near, and for this alone is worth planting by the orchardist.

The Miami Valley is the home of almost numberless growers of small fruits. In raspberries, the Cuthbert and Turner seem to be the favorites in the reds, and both bore full crops this year. The Marlboro, just being introduced here, gives promise of fine success. Of black caps, the Gregg takes the lead, though the Souhegan is liked by some because of its earliness, and some claim for it superior hardiness.

The Snider, in blackberries, takes the lead, and Taylor is much liked by those who have tried it. Lawton is too tender, and Kittatinny is generally destroyed by rust.

The Lucretia Dewberry continues to commend itself to all small fruit growers as a magnificent acquisition in the blackberry line. It ripens with the later raspberries, and is of such large and fine appearance and luscious flavor, that all who see it are delighted with it. It is generally hardy, and, being of a low, trailing habit, is easily protected from cold, by a covering of straw, or similar material.

In strawberries, the Crescent, Sharpless, Manchester, and some others of the newer sorts contest the field with the old standard Wilson, with varying results. Strawberries were an average crop this year in our section. No particular complaint in regard to destructive insects thereto.

A new applicant for favor, in the strawberry line, has made its appearance in our valley. The originator, Mr. F. G. Withoft, of Dayton, Ohio, found a few plants

along the D. and M. Railroad, in this county, near a telegraph pole, growing wild, and so named it the "Western Union." In foliage, the plant is particularly strong and healthy, a great desideratum under our scorching August suns, and the fruit is of large size and good flavor. Quite a large lot of plants have been grown here this summer, by the originator, and the coming season will doubtless give us more light on its probable value.

In conclusion, inasmuch as the Miami Valley is notably a great nursery center, and as horticulture and the nursery interest are almost inseparably connected, a short statement of the latter may not be amiss. Early in the present century, in the first settlement of this valley, the growing of nursery trees was begun, and has constantly increased to the present time. There are now, in this valley, within a radius of twenty miles, no less than sixty separate and distinct establishments, from the growers of a few acres up to those covering several hundred acres each, and growing millions of trees, yearly. By accurate statistics, each year, for several years past, there have been shipped from this valley not less than five hundred full car-loads of trees and plants, annually, making a total of over three millions of trees sent out yearly. With this stupendous growing of trees in one section, where so many are engaged in one business, it is not surprising, that very rarely indeed is it, that any of the new, the novel, or the standard and reliable in fruits or plants can not be found in some of the nurseries of the Miami Valley.

REPORT OF THE LUCAS COUNTY HORTICULTURAL SOCIETY.

BY W. W. FARNSWORTH, OF WATERVILLE.

This Society, and the branch Society connected with it, the Ladies' Floricultural Society, have passed another successful year. Our meetings have been largely attended, and the reports and discussions betoken increasing interest.

The Horticultural Society has about one hundred members; the Ladies' Society, about half as many.

Several of the adjoining counties in this State, and one just over the line in Michigan, have organized, or are about to organize, County Societies, for which we claim a portion of the credit.

The past few unfavorable years for orchard fruits have created the impression with many of our farmers and fruit-growers, that it does not pay to set out fruit trees, and many of them are acting upon this belief. We fear they will, before many years, regret this decision.

However, the Society grows in numbers, usefulness, and interest, whether the orchards bear fruit or not.

Our people realize the need of these means of social enjoyment and interchange of ideas, plans, and experiences, and are not slow to profit thereby.

W. W. FARNSWORTH, *Secretary.*

STARK COUNTY HORTICULTURAL SOCIETY.

BY J. F. NIESZ, OF CANTON.

CANTON, OHIO, December 2, 1885.

MR. GEO. W. CAMPBELL, *Secretary of Ohio State Horticultural Society, Columbus, O. :*

DEAR SIR:—I thought, probably, a few lines from the Stark County Horticultural Society, at this time, not out of place, to inform you that we are still flourishing, with interest and zeal unabated.

We held eleven meetings the present year, all well attended, "rain or shine." The attendance ranged from seventy-five to over six hundred, at the meetings during the year.

We always have fine displays of fruits, flowers, vegetables, grains, etc., at our meetings. At some of them we have as fine displays as we used to have at our County Fair ere our Society was organized, and, as a member stated, to-day, at our meeting, "the annual displays of fruit at our Stark County Fair have been steadily increasing, until at the last fair, we had the unprecedented number of 830 entries, and 1,213 plates of fruit on exhibition!"

We had from one-fourth to one half crop of apples in the county; a full crop of pears and berries.

We had some very excellent essays read within the year, and frequently have essays, songs, recitations, etc., from the younger members of our Society; and such dinners—almost “too rich for one’s blood!”

I write this after our day’s meeting, driving ten miles through the mud, then listening to a lecture by the grand and eloquent T. DeWitt Talmadge, hence it must necessarily be brief; and will send you a paper, in the morning, containing a full report of to-day’s meeting, and later will mail you our annual report, which, we flatter ourselves, will compare favorably with the doings of any County Society in the State.

Hoping you are having a pleasant meeting, and doing the horticulturists of the State great good, I remain,

Yours respectfully,

J. F. NIESZ, *Secretary.*

EASTERN CUYAHOGA HORTICULTURAL SOCIETY.

BY E. H. CUSHMAN, OF EUCLID.

MR. GEO. W. CAMPBELL, *Secretary*:

I take pleasure in informing you that we have an Eastern Cuyahoga Horticultural Society, of which I know you will be glad to hear. The forming of such a society has been on my mind for two years past.

Early in January, I got three gentlemen to sign a call, with myself, for a meeting, to be held at my home, on the 27th. About thirty-five ladies and gentlemen responded. A temporary organization was formed, name chosen, committee on constitution appointed, etc. All seemed pleased with the venture, and adjournment was taken until Friday, February 12th, at 2 p.m., at same place. The mud was very deep on that day, but we formed a permanent organization with twenty-nine members—about as many ladies as gentlemen.

The next meeting will be on March 3d, at Rev. S. B. Webster’s, in Euclid. Dinner will be served, after which the Society will come to order; papers will be read, and discussions had, on such topics as may come up.

The membership, at present, is quite local. I am in hopes that, by the end of the year, it will be as broad as the name.

There are many things to contend against here that a stranger would not think of. However, with hard work and heart-work they may be overcome.

As far as I have examined, all fruits are unharmed by frost, excepting peaches. Two eleven degrees minus, have killed all of the buds, I think.

We have an Early Harvest blackberry plantation two years set; they are all right yet. As this is pre-eminently a grape region, the small fruits are gradually taking a back seat.

REPORT OF THE MUSKINGUM COUNTY HORTICULTURAL SOCIETY.]

Mr. President, Ladies and Gentlemen of the State Horticultural Society:

Again I am pleased to say that our Society has held its regular monthly meetings; sometimes among its members, and at other places where invited by interested horticulturists. We have enrolled and paid up, only twenty-six members. The meetings have been largely attended, and considerable advance made in horticulture. Our exhibition tables, in general, have been well filled with fruits, flowers, and some vegetables.

Among the visitors who met with us was R. J. Black, of Bremen, in March, who addressed the Society on tree-planting.

Prof. Edward Orton, of Columbus, in May, addressed us with a most excellently prepared paper, entitled “The New Agriculture.” Again, in August, our genial Professor, W. R. Lazenby, spoke somewhat in a general way, alluding to the work at the Experiment Station at Columbus, etc. The thanks of all who were present

are justly due these gentlemen, and it is the wish of all, that they meet with us again in the future.

After much talk in the Society of publishing our monthly reports, it was decided to have them published in pamphlet form. After having several reports published, we discontinued them for the want of funds; not having any indebtedness, we had no desire to incur any, preferring to pay as we go.

We still continue to have our programme made out at the beginning of each year, and after the election of officers, we give them to persons interested, as well as the members of the Society, that all may know when and where the meetings are to be held. We also give notices in our county papers. The same papers continue to publish our reports, desiring that the reports be not too long, allowing from one to one and a half columns in the daily and weekly papers.

Our Society undertook to arouse the people and authorities to improve the first burial ground of this place, which is almost in the heart of the city, partially surrounded with an old, dilapidated fence, tumble-down and decayed head-stones, many of which have already entirely disappeared; the ground irregular, and more or less neglected and grown up in weeds and rubbish. And in this neglected spot, rests the noble, generous-hearted John McIntire. A monument has been erected, and the grave surrounded by a substantial iron fence, which was done some years ago. Here are from two to three acres, which should be improved and made in keeping with the times. Thus far our efforts have been in vain.

Our parks have been under the management of the City Council, and the trees planted several years ago are now large enough to afford shade, and during the warm days the parks are well patronized, sometimes too much so, by cows.

Our cemeteries, under the management of the trustees and the assistance of landscape gardeners and architects, have been considerably improved, the credit for no part of which our Society claim; but is due to those having taste and ability, brought about by observation of improvements at other places; for instance, Spring-grove Cemetery, at Cincinnati.

NEW FRUITS.

Some of the newer fruits have been on our tables; some of which have their origin among the members of the Society; but before condemning or recommending them it would be best to put them on probation a year or two longer before taking them into full membership, or dropping them from the list. So many new things are thrust upon the people that great care should be taken to recommend only such as have practical value.

Respectfully,

S. R. MOORE,
Corresponding Secretary.

STARK COUNTY STRAWBERRY SHOW.

By W. W. FARNSWORTH, OF WATERTVILLE.

In compliance with the request of Secretary Niesz, of the Stark County Horticultural Society, I attended their annual Strawberry Show, held at Canton, June 23d, 1885.

Going by way of Mansfield, I stopped off, over night, at the residence of Mr. F. R. Palmer, and was well repaid for so doing.

The surface of Mr. P.'s farm is rather rolling, and the soil mostly a gravelly clay, and here the black raspberry seemed to be perfectly at home. His Greggs and Ohioes were looking finely.

Mr. Palmer has a seedling black-cap which impressed me very favorably. It was heavily loaded with good sized fruit, that, judging from its comparative maturity at that time, would be among the first to ripen.

His Cuthberts were not doing as well as the blacks, and seemed to be suffering from the effects of the severe winter.

He was experimenting with the Lucretia dewberry, which was growing thriftily and creeping rapidly.

Upon reaching Canton, in company with Mr. Palmer, we found a large number of Stark county horticulturists assembled at the fair grounds. We also found Mr. W. J. Green, of Columbus, and Mr. J. P. Streeper, of Chillicothe, who had arrived before us.

We found a very creditable show of berries upon the tables. Most of the standard varieties now in cultivation, were represented by good specimens.

After a picnic dinner, the Society assembled in a large hall for discussion.

Crescent, Kentucky, Windsor Chief, and Green Prolific, seemed to be general favorites.

The meeting was a very successful one in point of attendance and display of fruit, but it occurs to us, that when practical, it is preferable to have the strawberry show at the grounds of some extensive grower, who raises a variety of kinds; as a practical fruit grower would give more for an hour's visit in a field, where twenty varieties of fruit were growing and ripening, than for an entire day spent in inspecting these same berries, or rather the best specimens of them, displayed on tables.

The Stark County Society seems to be in a thrifty, wide-awake condition.

REPORT OF MONTGOMERY COUNTY HORTICULTURAL SOCIETY.

BY N. OHMER, PRESIDENT.

This Society is about to enter into its nineteenth year. This will be the fifteenth year that the reports of their meetings have been published, and issued in pamphlet form to all its members and friends. Two hundred and fifty copies are so bound each year. All of my copies I have bound in book form, and value them highly. Had this meeting been held the second, instead of the first week of December, I would have brought with me, for distribution among you, quite a lot of pamphlet copies of our proceedings for this year, including the proceedings of the December meeting.

I have no recollection of the Society having missed a monthly meeting in the last eighteen years. The Summer, our out-door, meetings are usually attended by from seventy-five to one hundred and fifty husbands and wives, sons and daughters, all in their best, and on their best behavior. From fifty to eighty usually attend winter meetings.

The interest in the meetings does not seem to diminish. There is apparently as much interest taken in hearing reports on orchards, small fruits, ornithology, entomology, vegetable gardening, vineyards, botany, meteorology, ornamental planting, and essays, as ever in the history of the Society. The meetings are attended by rich and poor, old and young, in fact by all respectable classes. One not respectable, has no business there, and none come.

Our treasury is never burdened with too much money, we have enough, however, to pay as we go. Our Secretary receives two dollars for reporting all meetings he attends, also for correcting proof sheets before being printed in pamphlet form.

FRUIT AND FRUIT-RAISING IN LAWRENCE COUNTY, OHIO.

BY NELSON COX, OF BRADRICK.

In the spring of 1885, it was thought all the peaches were winter-killed; but in some localities there were some of the budded varieties which escaped and made very fine peaches. The localities which escaped were close along the bank of the Ohio River, on the first hilltops, and on top of the hills farther back, and in situations that appear to be fully exposed to the winds. As to seedling peaches, there was a bountiful crop on top of the hills. The trees did not appear so full as seedlings commonly do; but about the 1st of July it commenced to rain, and we had frequent showers from that time all through the summer and fall, so that the peaches made wonderful growth, and turned out more than double what was expected. Some of them grew to immense size, of good appearance and fine flavor, which made them sell very readily in market at better prices than is common for seedling peaches.

The apple orchards bloomed very full, and after the bloom dropped, there was a rather poor appearance for a crop, and as this was the off year in most of our orchards, there was not much expected; but the rains, and especially the later rains, did more for the apple orchards than for the peach orchards. Some varieties were so full the trees broke badly. The Smith's Cider was very full, and the apples hung on well, and got a very bright red color.

The Ben Davis, which is rather a new variety in our orchards, was over-loaded. But, notwithstanding the trees broke very badly, the apples grew large, fine, smooth and high-colored. It is the most promising variety we have.

The Crawford Keeper not very extensively grown, and usually a shy bearer, has done its best this year; and, although so full the trees broke badly, perfected a crop of very fine apples.

The old Red Romanite was the best for years. It was formerly affected with bitter rot, but was sound and smooth this time.

The Black Gilliflower had the best crop in ten years.

Westfield Seek-no-Further was better than ever.

And now for our native apple, the Rome Beauty. This being the off year, and as it has borne good crops on the even years for at least fourteen years, there was only about half a crop expected; but many orchards have turned off nearly full crops on our hill orchards, back from the Ohio River, and in those orchards that were not picked till late, the apples grew very large and fine colored, and it is said that the flavor is better than usual. The crop has been nearly all sold to speculators, and gone South; price, \$1.25 per barrel.

Pears were a fine crop, but not very many grown.

Grapes, fair crop; not many grown.

Cherries; early May; fine crop.

SUMMER MEETING OF THE OHIO STATE HORTICULTURAL SOCIETY.

CITY HALL, BARNESVILLE, OHIO,
TUESDAY, June 8, 1886.

The session of the Summer Meeting of the State Horticultural Society, held on the evening of June 8, 1886, at Barnesville, was called to order at eight o'clock by President Ohmer.

President.—We have postponed this meeting half an hour, waiting for your Mayor. I am told that he was to deliver a welcoming address. I do not think we need it. We have been welcomed all day. Every movement that took place, was an evidence of the welcome that you were tendering us. When it was announced that the meeting was to be held at Barnesville, I was very much gratified, as were other members of the State Horticultural Society. Your reputation as strawberry-growers is not confined to this State, but has become national. I have the evidence before me, that you do not confine yourselves to strawberries, however; for such a show of cherries I have not seen for many, many years. I will not detain you by further remarks. The next thing in order, will be the reading of the papers. It is expected that there will be two papers, and possibly three. We have seen so much and we have so much to talk about, that I desire a full discussion of the fruit question, especially that which pertains to the strawberry. As you grow many raspberries, we will consider that subject also. We want the members of the State Horticultural Society to speak out plainly, and we want the citizens to take part in the discussion.

Mr. Crawford, of Cuyahoga Falls, a gentleman whose name is often heard in connection with strawberry-culture, has a paper which he will please read.

Mr. Crawford then read his paper, which was as follows:

STRAWBERRIES AND STRAWBERRY CULTURE.

By MATTHEW CRAWFORD, OF CUYAHOGA FALLS.

Harvest time is a season of peculiar interest to every thoughtful person, and this is our harvest time, to which we have been looking forward. The plants now yielding their fruit have been in our employ for a year, doing the very best they could under the circumstances. Man with all his knowledge and skill can never make a strawberry, nor can he invent a machine to make one. He must have plants to do the work, plant food, the raw material out of which the fruit is made, and the soil to afford anchorage for the plants, and to furnish a reservoir from which they may draw their supplies.

Our part in the work is to furnish the most favorable conditions possible, and a strict account is kept from the first hour we have control of the plant. Nothing is forgotten. When we settle up in June, we are charged for every injury the plant has received from any source; for every hour it has remained idle waiting for supplies, and for every weed that has hindered it in its work. It avails nothing to plead ignorance, and say that we have done the best we knew. It is our business to find out what is required, and to meet every demand. Our profits depend upon our ability to do this, and the profits are what we work for. What returns we should have, if there were no charges against us for any failure on our part!

As our gains are increased according to our intelligence and care on the one hand, and diminished according to our ignorance and neglect on the other, it is very proper

that we come together at this season, and ascertain the causes of our success or failure, for our future guidance.

Strawberry plants were designed to produce fruit, and every day in the year, when not locked up in frozen soil, they are working towards this end. The greater part of their time is spent in gathering material, and in this we can aid them very greatly.

Our first step in this direction, is to prepare the soil in the best possible manner. It must be drained either naturally or artificially, for the roots cannot flourish in standing water. It should be made fine, so that the roots may work in every part of it. Plant food, if locked up in lumps, is as much out of reach of the plant as though it were out of the field.

The time has gone by for intelligent fruit-growers to rely upon the natural fertility of the soil alone, to furnish the material for a large crop of strawberries. The plants should have within reach, and in an available form, as much plant food as they can use. Large crops are never produced without a large supply of the raw material. If this be furnished in the form of stable manure—and there is nothing better—it should be thoroughly decomposed. If this cannot be obtained, bone dust and unleached wood ashes—not less than 500 pounds of the former and forty bushels of the latter to an acre—will supply all that the crop requires. This should be sown on the surface, and harrowed in, before the plants are set. The strawberry removes but little fertility from the soil, and it leaves the ground in excellent condition for the following crop. The plant contains a large amount of rich material, and this is why so much plant food is required. If the soil be rich and fine to a good depth, the plants will be the better able to go through a dry time without injury. This is especially important when the fruit is ripening, as much moisture is needed at that time.

The roots need air almost as much as they need moisture, and they are liable to be deprived of this by a crust on the surface, for which frequent stirring of the soil is the remedy. In addition to admitting air, this keeps down the weeds, but no deep cultivation should be given late in the fall, nor in the spring, among bearing plants.

If all these requirements be met, it makes no difference to the plant whether its roots extend through sand, clay, or muck, or a mixture of all three. It may, however, cost more to supply these conditions in one soil than in another.

Every effort should be made to get the plants to work early in the season, so that they may put in full time. Those set early, receive almost no check. They are then hard and ripe, and have no sappy roots or leaves to be easily dried by a short exposure to the air. If for any reason they cannot be set early, they should be taken up and have their roots shortened to two or three inches, and then be set temporarily about four inches apart. After a thorough watering they can be moved from this bed with but little risk until quite late in the season. Shortening the roots causes a large number of new ones to come out from the crown and from the cut ends, and the plant receives very little check in being moved if the work be carefully done. It sometimes happens that a large amount of rain causes the soil to run together and become very compact early in the season. By using transplanted plants later, the soil can be put in the best possible condition.

It is a critical time in the life of a plant when it is out of the ground. It is like a fish out of water—it may not die, but it is dying. It should be kept out of the soil the shortest possible time, and should be shielded with the greatest care from injury by drying, heating, or making a blanched growth at the expense of its own vitality. For this reason, every extensive grower should raise his own plants, with the exception of new varieties that he may wish to test in a small way. He will then have them just when needed, and be sure that they are well grown and true to name. If plants from an old bed be used, it is important that they be washed clean, lest the eggs or larvae of insect enemies be carried to the new plantation. The strawberry plant is made up of such rich material that every part of it is attacked by insects. Prof. Forbes names thirty insects that prey upon it. A knowledge of the best means of combating these pests is indispensable to the highest success.

There can be no doubt that the crop is often greatly diminished in this climate, on heavy soil, by injury done to the plants during the winter. To reduce this injury as much as possible, the whole surface should be covered with straw to prevent frequent freezing and thawing. The same covering will serve as a mulch in the summer, to keep the ground moist and the fruit clean.

Strawberries are grown in hills, matted rows, or a compromise between the two. Hill-culture is the method adopted by the most careful growers who aim at the highest perfection. They raise the largest crops and receive the highest prices.

For hill culture, the varieties that produce the finest fruit are chosen, and if they send out but few runners, so much the better.

The principal objection to this method is that the same ground is occupied by the plants for a number of years in succession. This gives a favorable opportunity for insect enemies to multiply. Unless burning over the patch after fruiting will destroy these enemies, I fail to see how they can be exterminated without sacrificing the bed. Matted rows may be, and often are, kept year after year, but the plan of setting a new bed every year, and plowing it up after one crop, is coming into favor.

Varieties noted for their vigorous growth and productiveness have always been favorites with those who use the matted row method. Their aim is to get quantity rather than quality. In order to select wisely, it is necessary to have a knowledge of the merits of the different kinds, but obtaining this knowledge for one's self by testing new varieties is an expensive business. Fortunately for us, the Ohio Agricultural Experiment Station is doing this work with great thoroughness and perfect impartiality. Every tiller of the soil should use his influence in favor of this establishment that sends out the truth, the whole truth, and nothing but the truth.

President Ohmer.—According to the programme that I have in my hand, two papers are to be read, after which there will be a general discussion. The next is a paper by members of your Association, on "Strawberry Culture" from a Barnesville standpoint.

The report of a committee appointed by the local Society was then read, which was as follows:

STRAWBERRY-CULTURE FROM A BARNESVILLE STANDPOINT.

BARNESVILLE, O., June 8, 1886.

The Committee appointed for this purpose by the Eastern Ohio Agricultural and Horticultural Society, respectfully submit the following essay, giving the results of their investigations and deductions therefrom. As an appropriate preface, a few extracts are here introduced from an essay read before the Eastern Ohio Society two years ago, viz.: "Twenty-five years, ago few strawberries were grown for sale in this community. In the spring of 1860, the late William Smith, Esq., introduced, and with a few others (C. G. Smith and John Scoles, only known to your committee) cultivated in limited quantities the Wilson's Albany Seedling for our little home market." * * * "The demand justifying the production was slowly at first, but steadily increased, from a beginning of a few quarts on a few rods of ground to about 1,500 bushels last year (1883), which sold for about \$12,000, with good promise of a fair increase this year (1884)." The shipping trade opened about a dozen years ago, first to Columbus, Ohio, and Wheeling, W. Va., and later on to other near markets, but not until four years ago was the experiment made of shipping to Chicago, which was done in a small way, at a reasonable profit, by James Edgerton; but owing to the shipment being made to a grain-merchant, that effort failed to attract much notice until two years later, a special fruit-dealer paid us a visit and fairly inaugurated the trade with that city, and now a car is daily standing on the siding to receive and carry in the express passenger train, its precious load of this luscious fruit to the great city of the lakes. * * * * The day is not far distant when a whole train load daily, in its season, will be sent away to the same unsuppliable mart. Yesterday, over two hundred bushels went on their way thither. This was two years ago. Now, this week, a special train of four car-loads daily are going to Chicago, and prices realized are satisfactory, ranging from \$2.50 to \$3.50, clear of freight and commission.

The Committee appropriated one day, recently, to visiting some of the principal strawberry farms, and interviewing the growers; from which interviews and sundry others, obtained individually by members of the Committee, embracing answers to a series of over twenty questions, the following facts are compiled, and deductions and conclusions are arrived at by the Committee:

Sixty-six growers report two hundred and fifty acres, of which about one hundred and forty acres are now fruiting, and the remainder newly planted the past spring. This does not represent the entire acreage grown within two miles of this building. Perhaps, there are twenty acres additional, but mostly of this year's planting. Outside of the area mentioned, there are only a few growers and to small extent. Fourteen different growers, among the most experienced, estimate their average yield per acre all the way from 50 to 150 bushels, viz.: one, 50; one, 70; two, 80; one, 75; one, 87; one, 90; five, 100; one, 135, and one 150 bushels. Average, 94 bushels.

Shipments are now 1,000 bushels per day, of which 800 go to Chicago, the balance divided among a number of points East and West.

Of the varieties which have proven profitable, the Sharpless holds the enviable position of first on the list. While many of the largest berries are somewhat ill-shaped, their immense size, good flavor, shipping qualities, and the rapidity with which they fill baskets, make them at present, the general favorite. Some growers, however, have not succeeded well with this variety; the cause of failure in most cases being attributed to the soil being too light and sandy. The soil best adapted seems to be a clay, or clay loam, and as it is more easily frosted, it should not be planted on low ground.

The second place is claimed by various growers for the Cumberland, Charles Downing, Wilson, Crescent and Jucunda. But the order in which these several varieties would be placed by the majority of growers interviewed by the Committee is as follows: Cumberland, Crescent, Downing, Wilson and Jucunda. The uniformity of size, shape, color and good flavor of the Cumberland makes it a favorite with the consumer as well as with most growers. The plant is a good grower on most soils, but some think it better adapted to sandy than clay soil. It will not bear as heavy fertilizing as some others on account of making the berries too soft for shipping long distances. Deficiency in shipping qualities is the principal objection to this variety. The Crescent and Wilson are valued because they will stand rougher treatment, will grow on a greater variety of soils, are great bearers and good shippers. The objections being, so many small berries, and the amount of sugar required to make them eatable.

The old Jucunda, which has done so much to give our vicinity a reputation for fine strawberries, has been placed on the retired list by most berry-men. Only two growers have been found who give it a place in the list of profitable varieties. It seems to be more choice of soil than most other kinds, requiring a pretty stiff clay. It seems to be the opinion of many that this and some other varieties which were once considered profitable, have degenerated or run out, and that the popular varieties of to-day will do so in the course of time. Admitting the probability of new varieties of superior merit being introduced, there seems to be no fear in the minds of some as to the degeneracy of the profitable kinds now grown, if intelligent management is practiced.

Varieties which have proven unprofitable under favorable circumstances, are the Manchester, Bidwell, Glendale, Jersey Queen, James Vick, Black Defiance, Mrs. Garfield, Piper's Seedling, Ironclad, Big Bob, Daniel Boone, Kentucky, Mt. Vernon, Atlantic, Downer's Prolific, Windsor Chief, Finch, and Monarch of the West. Some of these are almost worthless, while others will, under favorable circumstances make a fair yield; but so long as there are other so much more profitable kinds, they are not considered worth cultivating merely for the sake of variety. It is perhaps due that we make special mention of the Manchester, as it gave promise when first introduced of being a leading variety, and a few still hope to be able to grow it successfully. The only draw-back seems to be the blight or rust, which attacks the leaves during hot weather.

New varieties being tested which promise to be profitable are the Jewell, May King and Belmont. These, however, have not been sufficiently tested to merit a recommendation.

The location of a strawberry plantation is a question of much importance. While they have done well on the several different kinds of soil found in this vicinity on different slopes, and varying elevations, they generally do better, well up from valleys and on the eastern or southeastern slope, and always fail on land inclined to be wet or sour.

The preparation of soil should commence at least one year prior to planting. Any hoed crop that will leave the ground in good condition may precede, but potatoes are generally preferred. If the ground is not already rich, apply fertilizers liberally to this crop. Some of our most successful growers, manure heavily in the fall, and plow under just as freezing weather sets in, thus exposing the insects and clods to the beneficial action of frost. Apply a lighter top-dressing of manure in the spring, and plow either with a shovel or mould-board plow, as the case demands.

The kinds of fertilizers, amount per acre, and manner of applying, all admit to be important factors in successful strawberry-culture, but as yet there is no general plan or system followed by a majority of our best growers. Stable manure is generally preferred, and should be applied at the rate of about 100 loads per acre. The only objection to it being the grass or weed-seed, and the insect-germs which it may contain. Different kinds of commercial fertilizers have been used with satisfactory results.

As the grub is the principal insect enemy of the strawberry-plant, great care should be taken to eradicate it before planting. Here is the principal argument in favor of commercial fertilizers, instead of stable manure. As yet, no efficient and practical means of preventing the ravages of this pest, after planting, has been practiced, other than to search out and kill.

The planting should be done as soon as the ground will admit of thorough preparation in the Spring. The rows should be marked very shallow, about three feet apart. Plants are generally set with a common gardener's trowel, about 15 inches apart, the crown being about level with the general surface. As the lifting by frost is something to be guarded against as much as possible, some advise making deep furrows, and setting the plants part way up the side, thus getting the roots deeper, and obviating, to some extent, the covering of plants by hard rains; the furrows to be filled up the first working.

Cultivation should begin as soon as the plants have rooted and commenced to grow. Shallow culture is generally practiced; and the cultivator with narrow shovels or teeth, is the implement in general use. The hoe and fingers, however, are the most important tools in the berry-patch. Some use the plow with long, narrow shovels, and cultivate to greater depth. The amount of cultivation required, depends somewhat on the character of the soil, the weeds, and the frequency of rains. Plow and hoe, or hoe without plowing, about every two weeks, till the 1st or 15th of September, is what is generally recommended. The ground should never be allowed to remain crusted after a rain. Runners must be kept off, unless plants are the crop desired.

Mulching should be done just before winter sets in. Clean wheat straw is generally preferred, and spread uniformly over the ground, at the rate of two to three tons per acre. The first work in the spring, is to open the straw immediately over the plants, to give them a chance to grow. Pull out the weeds that may come up through the straw, before the ripening of the fruit. Care should be taken not to displace the mulch around the plant and allow the fruit to become sanded.

As soon as the crop has been harvested, commence cultivating again. A few recommend cutting tops off, but as this is somewhat risky, it is not practiced to much extent. The mulch is generally plowed in, if it can be done conveniently.

Cultivation should be thorough from this time till fall. Deeper plowing is generally practiced, if the ground is not too dry, than during the first season. Some growers allow runners enough to grow to make a matted row, while others cut back to the original hill. This depends somewhat on the variety, as some kinds admit of heavier growth of plant than others.

It may not be uninteresting to beginners, as well as the general public, to know something of what it costs to produce first-class strawberries. The total cost per acre, of the first crop, up to the time of picking, according to the testimony of the various growers interviewed by the committee, ranges from \$80 to \$150—the variation is caused principally by the amount of fertilizer required—\$100 being the figure generally named as the average cost. Average cost of picking, about 55 cts. per bushel; of marketing, \$1.00. Per cent. of crates lost and destroyed varies from 10 to 33½ per cent., 20 per cent. being about the average.

There is a great lack of co-operation and system on the part of growers, in regard to marketing our berry crop. As yet, each shipper is independent of all others, depending chiefly for information as to the condition of the various markets, on the numerous agents who are always busy soliciting consignments for the houses they represent. This condition of affairs is probably owing to the fact, that until within a few years, the profits were sufficiently large to satisfy most shippers, after paying liberally for freight, commission and business experience.

The proportions which this industry has now reached, and the small margin of profit to the grower, will necessitate the adoption of some co-operative or more economic plan of disposing of our berry crop in the near future.

J. T. SCOFIELD,
WM. STANTON,
PERLEY PICKETT,
Committee.

President Ohmer.—You have just heard a very interesting report of the committee, appointed by the members of the Association of this neighborhood. That of Mr. Crawford's was also an excellent paper; both together touching upon almost all points connected with strawberry-culture. Notwithstanding all that, a great deal more can be, and I hope will be said, by individual mem-

bers of this audience. I do not know members well enough to call you out, but I hope you will get up and give strawberry-culture a thorough discussion. Many of us came long distances to visit your magnificent strawberry farms, I might call them; our eyes were wide open when we rode from place to place and walked over patch after patch, all seeming to be as full of fruit as possible, notwithstanding it was said of some, "this patch has been picked two, or three, or five times." It seemed incredible to us. We came here to learn. Do not hesitate to get up and speak. I am now directly addressing my remarks to members of the Eastern Ohio Horticultural Society, and those who live about here. We want to waste no time. Get right up and tell us what you know.

Mr. Leo Weltz.—We have Mr. Scoles here; he is full of the subject, and no doubt will tell us some of his secrets. He raises fine berries, and we would like to know about it. We raise a good many berries, but not such fine ones as he grows. I know he is here, and no doubt will give us an explanation of his success.

President Ohmer.—I hope the gentleman is not too modest to do as he is requested.

Mr. Scoles having nothing to say, Mr. William Stanton was called upon to open the discussion.

Mr. Stanton.—Mr. President, we feel that we have had our say in the reading of this paper.

President Ohmer.—I would like to hear from Mr. Farnsworth. He is quite a successful strawberry-grower, and we would like to have him open the discussion. Mr. W. W. Farnsworth, from Lucas county.

Mr. Farnsworth.—When I came here I was chock full of strawberries, as the saying is, but it was from a different stand-point. They have made so much fun of the Crescent here to-day, that I am tempted to keep still. A gentleman made the remark that he did not see why anybody should cultivate Crescents, when he could grow such Sharpless as you do here, nor do I; but we cannot all grow Sharpless successfully. In our neighborhood, we have no such reputation for fine berries as you have here. We do not grow berries so extensively as you do, but in the county adjoining me, there have been some large growers. They have grown the Wilson until the last few years; it is failing utterly in my own neighborhood. I grow, as I said before, the Crescent principally, and our main study is to find sorts to fertilize it. For this, we use a number of varieties. I have strong hopes of the May King. The Sucker State seems to be a good variety for the purpose. I find, upon trial, that the Crescent is well fertilized by them.

Our county is very different from this; it is quite level. I was almost afraid to ride over these hills to day. We have scarcely a hill in our county, back from the river. Our soil is also different. It is limestone soil mostly, a sandy loam, varying from a dark coffee to chocolate color.

I did not use nearly the amount of fertilizers, nor the labor on the Sharpless that you do here, and had I done so, I should have obtained no such results. We have to fertilize the ground to some extent. I hardly ever put on more than thirty to thirty-five loads of manure to the acre. I usually set the plants in rows, from three to four and a half feet apart, and allow the runners to take root, forming matted rows. I adopted a different plan this year, which is strongly in contrast with your system. I had a field of five acres of sandy loam, new ground. Two crops of corn had been grown on it. We grubbed out as many stumps as possible, and still there were plenty left. I then set the plants in hills, about three and a half feet apart each way, and cultivated them until harvest time, when the runners were allowed to grow. I think the Cres-

cents in this field will yield at least seventy-five bushels per acre. I intend to enrich it with fine stable manure immediately after the fruit is picked.

Some practice cutting off the plants after bearing. I have tried the plan for several years with good success. We drive into the patch with a mowing-machine, and cut off the plants level with the ground, or as low as possible, and then if there is enough dry material on the top, so that fire will run, set fire to it and burn it off.

There is another thing in which our practice differs from yours. I never mulch my plants. The reason why I do not find it necessary, is the difference in the soil and varieties. The Crescents do not grow as large as the Sharpless, and we seldom have a sandy berry. Our soil does not heave in the winter. We have no trouble with the frost throwing the plants out of the ground. I have never cultivated the plants in the spring before bearing. I usually pick two crops, but sometimes only one from the same bed. I have one patch this year from which I am taking the second crop.

I came here to learn, not to speak. If any one has any questions, I will answer them.

Member.—In setting fire to the vines, does it kill any of the plants?

Mr. Farnsworth.—We have never found it to kill any. It might be different when the plants are grown in hills. The Crescent forms too many plants, and there are usually enough left after burning. The entire cost of growing five acres, including the interest on the value of the land, was one hundred and twenty-five dollars, when the fruit was ready to pick. Could I have applied twenty-five or thirty loads of manure, I should have done so.

I have not received much benefit from commercial fertilizers. Ashes, perhaps, are the most profitable commercial fertilizer used. I am so situated that I can get an abundance of them. I have used them quite freely, especially on raspberries, and with marked effect. I think that the rows to which I applied them, yielded fifty per cent. more than those alongside, where none were used.

Mr. Sears.—I wish to ask whether the fact of the plants not heaving in the winter, is not mainly due to the regularity of the winter, there being no break-ups? When your ground freezes up for the fall, doesn't it remain so until spring?

Mr. Farnsworth.—No, I think our winters are about the same as yours here. It is due mostly to the character of the soil, and especially to our growing in matted rows. The plants protect each other largely.

President Ohmer.—I will now call upon the Hon. N. H. Albaugh, of southern Ohio.

Mr. Albaugh.—Mr. President, unfortunately, perhaps, for us in the Miami Valley, the garden spot of Ohio and the world, we find sometimes, that the soil won't grow everything without paying some attention to it; and I have been impressed with that fact more since I came here, than upon any previous occasion. We do grow strawberries, however. In fact, about Cincinnati, and on the hills along the Ohio, and up through Warren and Miami counties, was the great strawberry center and strawberry region of Ohio, a few years ago.

When you were growing tobacco here, we were growing Hovey's Seedling, the McAvoy, and Burr's New Pine. I think that if some of the old berries that we used to raise at that time, should have happened to find lying near them in the row, such berries as we see here on the table, they would have pulled their stalks clear out of the ground, and lit out over the fence.

After the varieties I have named, came the old Wilson's Albany. We have not quite as much confidence in that variety as we had a few years ago. We grew them by acres and bushels, and we sold them all over the State of Ohio and the northwest, and you sugared them till you could eat them. We were

willing to raise that kind of a berry, as long as you were willing to buy the sugar to put on them.

You are particularly blessed with a soil and situation to grow berries to their greatest perfection. Some of the growers to day told me that when you first began here, you grew small berries and peddled them out at five cents a quart; but you have improved upon that both in size and price. I think it was Henry Clay who wished to be a lawyer, and was told by his father that the profession was full and that there was no opportunity for a young man to get along in the profession of law as long as there were lawyers on every street corner. He remarked to his father that there was always room at the top. This is true of all professions, and you have found that there is room at the top. The old saying is, that when we once get a reputation for early rising, we can lie in bed till noon, and no one will know any better. I hope you will not proceed upon that plan in strawberry-culture, but always be endeavoring to add to your good name. The reputation of Barnesville strawberries has not only gone to Chicago, but throughout the northwest. This shows that even in so small a business as the berry business seemed to you when you first began, whatever is worth doing at all, is worth doing well.

To-morrow is our regular meeting of the Montgomery County Horticultural Society. That has a world-wide fame, because we sometimes tell more than we know, and people have got the idea that we do know a great deal. We had a meeting a few days ago. At that meeting there were about a dozen varieties of strawberries. I hope I shall not hurt any-one's feelings, when I say that they compared favorably with the largest you have on the table here to-night. Most of them were new, amateur varieties. Our people need to be impressed with the fact, and I am going to tell them when I get home, that the rich soil of the Miami valley can be made still richer, in the same way that you have done with your hills. The newer varieties, that probably you have not experimented with, were the Photo, Cornelia, Jewell, Jersey Queen, and that Barnumized sort, Jumbo.

Your business here has undoubtedly grown up from the carefulness with which you attempted to grow your berries; and without flattery, I think I can tell you, from the honesty with which you have packed them, and sent them to market. Buyers like to find as big berries at the bottom as at the top.

I hope that if ever we have a strawberry show in our Montgomery County Society, we shall put that attention upon our rich bottom-lands, that will enable us to show something like the results you do here, and that we will not think because we own rich soil, we can grow everything we choose, without giving it proper attention.

President Ohmer.—We have heard northwestern Ohio represented in an address by Mr. Farnsworth, and now southern Ohio; I now call upon Mr. Palmer, of central Ohio, from Mansfield.

Mr. Palmer.—Mr. President, Ladies and Gentlemen: A few years ago, we heard all over the State of Ohio and elsewhere, that they grew big berries at Barnesville. Many people asked me, "Where is Barnesville?" A week or two ago, I got several letters from parties who had heard of this meeting, asking where Barnesville is, and how they could get there by rail. I told them as well as I could. I don't know whether they couldn't find the way, or what was the trouble, but they are not here.

Two years ago, I came down here to a meeting of your Society in raspberry time. It was on the third of July, I believe, and I came to see how it was, and why it was, that Barnesville could beat the world on strawberries in the Chicago market. When I got here, or on my road, after we left Zanesville, and came down among the hills where the grass wasn't long enough to feed sheep

and the soil growing very small mullein, I wondered if I was coming to the Barnesville strawberry region. The wheat was not so good as we raised, nor the corn equal to that near Mt. Vernon and Fredericktown. I concluded there must be something peculiar in the climate or the soil about Barnesville, if they could beat us on strawberries, when they couldn't beat us on wheat and corn. I told them the secret was this: it was a soil adapted to their growth, well under-drained and manured, and the principal secret was elbow-grease and steel. You are a little proud, I suppose of your reputation, and that is the reason you get up early and commence hoeing, and hoe late. A little stimulant of that kind is a very great help. You have a climate here, and a soil that is adapted to the growth of large varieties. Your reputation has been made with the Cumberland and the Sharpless. I suppose you know that, without being told. In our vicinity, and in southwestern Ohio, I have seen better Crescents than I saw here to-day, but I never saw such Sharpless, and if I lived at Barnesville, I should grow the Sharpless almost exclusively. With us, they fail at least two years out of three. We are liable to frosts in the spring that kill the Sharpless blossoms, when the Crescent and other varieties will stand alongside them, and not be injured at all. I wondered why it was, to-day, that I found no Windsor Chief here. We can grow more fruit from it than from any other variety. It looks to me as if your mode of culture, and your soil and climate, adapted to the growth of the Sharpless and the Cumberland Triumph, is where your success lies. To-day reminds me of a little story a friend told me after visiting Florida last winter. He saw a colored man working in a field, and said to him, "My dear sir, what is land worth an acre, here in Florida?" "Well," was the reply, "the land ain't worth nothing, but the climate is worth a hundred dollars an acre."

President Ohmer.—I will now call upon Mr. William J. Green, horticulturist of the Ohio Agricultural Experiment Station at Columbus. The gentleman has been connected with the Station for several years, and is quite well versed in strawberry culture and strawberries.

Mr. Green.—Mr. President, I should need to be a great deal better versed than I am, to feel like saying anything here. I cannot tell you anything new, and if I cannot do that, I can do nothing more than say old things over again. I had better not take up your time. I have wondered why you do not try more of the new varieties. Of course, it would not be possible for you to plant them to any extent, but it seems to me, it would be possible for you to test almost everything in a small way. There are a number of new varieties that seem to me to be very promising. There is Bubach's No. 5. I cannot see why it would not be an excellent variety for you to test, but I have not seen it growing here. The Sucker State is a variety that is not new, but is worthy of more attention than it has received. The berries are almost as large as those of the Cumberland, and the plants are two or three times as productive. Crawford's No. 6, I need say nothing about, because it is not introduced; but I believe the berries are about as fine as anything I have seen. The Ontario is another fine variety. The berries equal those of the Sharpless in size, and are perhaps more regular in form. There are a dozen kinds that I should like to speak about, but they are not introduced and not named. We have them on trial, and I think you will hear from some of them in a few years. We are trying everything we can get. We know we cannot try them fully for the whole State, and I wish it were possible that we could have branch stations in different parts of the State. If we were able to give some one here the plants to test, you could have them right before you without any cost to yourselves. At present, we are not able to do anything of the kind. I hope that sometime in the future, we shall be able to secure money enough to establish branch sta-

tions in several parts of the State. A great many think that it does not amount to anything, testing varieties in one locality for the whole State. There is something in that, of course, perhaps a great deal, but I don't believe there is as much in it as there has been supposed to be. There are varieties that do well in some places and do not do well in others, but they are soon dropped from the list. The best varieties are those that do well almost everywhere. This is a matter that ought to be tested, to find out if it is true that varieties are as variable in different localities as we commonly suppose; and I hope the day is not far distant, when we can have a dozen or more stations to test small fruits, throughout the State.

President Ohmer.—I don't wonder that they don't test new varieties much, when I see such berries as they get from their old varieties. The name of the Honorable Samuel Hilles is suggested. Will the gentleman please favor us with some remarks?

Mr. Hilles.—Mr. President, like many others, although I am growing strawberries, I came here to listen and to learn. I have had no experience in growing strawberries, except within the last four years. I do not feel prepared to talk to this audience, consisting of persons who have been in the berry business for many years, as have a great many of our citizens and neighbors.

I think, perhaps, we are making a mistake, or will make a mistake, that we shall be sorry for, when we have a severe frost, in letting the Wilson go for larger varieties. I am afraid we are making a mistake about that. I think that we should keep the Wilson. My observation has been, that the bloom of the Wilson will bear more severe frost, than the Sharpless and most other varieties. We have tested quite a number of varieties in this vicinity that have done well in some localities, but here they do not pay. We do not grow berries here for fun, nor to look at. We take a great deal of pride in producing large, slightly fruit, well colored, that will stand transportation to our cities, four hundred and thirty miles away, both east and west. A berry that won't stand shipment is of no use to us. We do not want any soft varieties, even if they are good producers. We are retaining only such varieties as we think will stand shipment. A great many over-ripe berries are being shipped this year. Last Friday, I had a bushel of Sharpless that I thought were so green that they never would turn red, and hesitated about shipping them; but they brought me a dollar more in Chicago than a bushel of what I called good Sharpless. I saw a great many berries, to-day, still in the patch, that, in my judgment, were entirely too ripe. By to-morrow, those berries will be so ripe that they will scarcely bring half their value in Chicago. The Sharpless berries, I think, should be picked when the fruit is green at the point. When the berry is fully colored, ripened at the point, it is too ripe to ship to Chicago.

Another thing I should like to say is this: every man has his own system of shipping. We have never got together as berry-growers and formed an association by which these results could be improved; but I think if we could form an association of that kind, we would be able to get a better price for our fruit, and be less liable to be cheated out of a great many bushels that are sent away. In my judgment, the shipments should all be made by one man. I think that we will come to it. I found, while in Chattanooga, four or five weeks ago—not with the Senatorial party, either—that they have an association of that kind, and I learned something of its workings. The people that grow the berries know nothing about where they are shipped, except that they are sent north, as a matter of course, where there is money. They say they get better prices than they got when they shipped each for himself. Perhaps

I shall not get an opportunity to talk to our berry-growers again, very soon, and I think it is important that we have an association, and the sooner the better.

Now, about varieties. The Jersey Queen is a very beautiful berry, of a fine flavor, but in this climate, and in this neighborhood, my observation is, that the plant is very much like a wild plant, and hugs the ground very close. They are very light bearers, and not profitable at all. We have no time to spend with such varieties. We have tried the Manchester, which, I think, will do better. The Sharpless is our pride. The Cumberland is one of the finest sorts that is grown, and I am very partial to it when I have a piece of ground that will grow them. They do not do well on clay ground. I believe that I have made more money from my half acre of Jucundas, than from any other that I have. It is a beautiful berry, and is my favorite. It is one of the best canning berries that we grow, next to, if not better, than the Wilson. The Glendale has done well with me. I was surprised, last year, when shipping these berries. I expected every shipment to hear that they wanted no more of them. I got a card from a gentleman, saying that he had received a bushel of Glendales, and he wanted to know if he could have another bushel. I have always had a desire to see that man.

I don't know anything now, that will be of further interest to the association, except my experience with fertilizers. Top-dressing with good stable manure is the best fertilizer, I find. If it is harrowed in after plowing, I think the plant gets the benefit of it the first year, and all the years after, as long as the plantation lasts.

Member.—I would like to ask if there has been any analysis of the soil here, compared with that of Miami county?

President Ohmer.—I judge not. I know of none.

Member.—I thought it a little strange that Brother Albaugh made the remark that they raised strawberries, when we raised tobacco; and now they raise the tobacco and we raise the strawberries.

President Ohmer.—Mr. Albaugh is rather modest, and I will say for him, that they never had quit raising tobacco.

Mr. James Steer was called upon for remarks in reference to deep planting.

Mr. Steer.—In regard to planting, my practice has been to furrow out the ground pretty deep, then rake the edge of the furrow, and plant about half way down the side. I used to make the surface as smooth and level as possible, but now I am not so particular about having it so. I prefer to leave it so that the water will sink away from the crown of the plant, when we have such rains as we have been having.

Member.—Do the plants so planted stand the drought better?

Mr. Steer.—I think they will. I like to furrow out as deep as I can with a large shovel-plow, and then rake the lower side of the furrow and make a mark about half way down, where I set the plants.

Member.—Does it prevent heaving?

Mr. Steer.—I think it does.

Member.—Will not after-culture make the plants too deep?

Mr. Steer.—If we are careful in planting to set the plants about half way down the side of the furrow, I think it quite an advantage.

President Ohmer.—We are honored, to-night, by the presence of Charles A. Green, of Rochester, New York. Will he be kind enough to address the audience?

Mr. Green.—Mr. President, I have nothing in particular to offer more than to say that I am very much pleased with what I have heard, and with the very

fine display. I am particularly interested in the strawberry. It is my hobby. I have come here to learn how it is that you have met with such great success. Perhaps you would like to know yourselves how it is. I should say, in the first place, that these hills have been a great thing for you. It is a fact that you have a better market than most strawberry-growers. That is something that you ought to appreciate. You have the very best market in the country, and your berries being so much earlier than those of other parts of the country, gives you a wonderful advantage. The prices that you get for your strawberries are something remarkable. The average price of strawberries in Rochester, last year, was from four to six cents. Here it was not less than ten cents. If I owned land here, I should set out every acre of it to strawberries.

You have spoken about the Big Bob. It is not what we have. As it appears here, it is a very large, fine, and valuable variety.

Member.—Will you please tell us how you can make money raising berries and selling them at four cents a quart?

Mr. Green.—Although prices are so low, they don't give up. They get better prices at first, but towards the last, prices go down. Last year, it went down to two cents a quart.

Member.—What do they pay for picking?

Mr. Green.—Two cents a quart. [Laughter.]

President Ohmer.—I would like to ask a question—whether it is possible that the production of strawberries will become so great that it will no longer be profitable to grow them? Can we not improve our circumstances in other localities, by raising larger, finer berries than we do? We raise good berries, but not as fine as you do here, especially of the Sharpless. We do not spend half the money for fertilizers that you do. We think that the soil is good enough to grow any thing with but little fertilizing. That is a mistake. We are finding it out, and I am going to tell our people so, when I go home. We came here to learn, and we have learned. I know I have. We should like to continue this discussion a while longer. Probably you would like to say something upon the raspberry. I find that the Gregg is doing remarkably well here. Your system of culture is correct, according to my judgment. Something might be said upon other varieties than the Gregg.

Mr. Leo Weltz stated that the fame of Barnesville strawberries had even gone so far as Russia. Strawberries are cultivated to some extent there, but mostly by pot-culture, in green-houses.

Mr. Sears —There is one thing that I have not spoken of at all. I wish to bring it up for the consideration of the berry-growers; and that is, whether the plants produced from the first joint, and what we denominate suckers, are inferior as to productiveness?

Mr. W. J. Green.—I do not think that the question can be answered, but we are working at it at the Station now. We have taken Sharpless and Cumberland plants that had no blossom-buds at all, and planted them; and we are going to test the difference between them and plants that have the highest number of blossoms. We cannot answer the question yet, however.

President Ohmer —I notice that the people are leaving. Possibly it is time for us to adjourn. I do not wish to adjourn, however, without thanking you for the manner in which you have entertained us to-day. I do so, for the State Horticultural Society. We, as members of the Society, have learned a great deal. At any rate, I can say that I have. I shall go home and make a good report to our Montgomery Horticultural Society of what I have seen, and it will make a good impression there. While we are an old Society, we are not too old to learn.

The Awarding Committee has not finished its work. There was a great deal for it to do. They will continue the work until completed. It will take, I hope, but a short time.

Mr. Sears.—I find an article here on the table that is said to be a raspberry basket holder. If any one can give us some information about it, we shall be glad to receive it.

President Ohmer.—The President will say that he has about one hundred and twenty-five of them, and, for the purpose intended, they are the best thing out. They are for holding raspberry-pickers' baskets. They are made at Howlet Hill, New York. They are worth about two dollars a dozen, or fifteen dollars a hundred. I can recommend them very highly, indeed.

Mr. Charles A. Green also spoke very highly of them.

The basket holder spoken of was displayed, and its use illustrated.

Upon motion, the Society then adjourned.

Soon after adjournment, the Awarding Committee completed its report, and offered it to the Society. It was as follows:

REPORT OF COMMITTEE.

Jas. A. Hogue has the finest exhibit of cherries, consisting of nine varieties, as follows: Early Ohio, Black Tartarian, Early May Duke, Reine Hortense, French May Duke, Black Eagle, and three unnamed varieties.

Messrs. Ault, Scoles, Sears, Griffin, Walton, Bently, and Thomas, also had fine collections.

J. V. McLane had the finest bouquet on exhibition; Jennie Gibbens, second best. Miss Edgerton also had a beautiful bouquet of roses.

D. N. B. Stanton has the best basket of Sharpless on the table, although those of Albert Bently and C. C. Smith are so fine, that your Committee found considerable difficulty in deciding.

There are a large number of baskets of Cumberland on exhibition, and they are all very fine. The first premium is awarded to C. C. Smith.

Peter Sears takes first premium on Crescents.

Hon. Samuel Hilles has the best Wilson; also, Charles Downing, Jersey Queen, and Manchester.

D. N. B. Stanton has the best Jas. Vick.

Jas. Edgerton has the best Bidwell.

Samuel Hilles has the best Glendales.

W. W. FARNSWORTH,
M. CRAWFORD,
JNO. F. BEAVER,
Committee.

It was unanimously agreed, that this was one of the most pleasant and profitable meetings ever held by the Society. Those that were present will always hold pleasant memories of Barnesville, and the kind hearted, intelligent members of the Eastern Ohio Horticultural Society, who did so much to make this summer meeting of the State Society, an ideal one.

SUMMER MEETING OF THE OHIO STATE HORTICULTURAL SOCIETY—ADDITIONAL REPORT.

BY W. J. GREEN, SECRETARY PRO TEM.

The summer meeting of this Society was held at Barnesville, on June 8th and 9th. At 9 a m., Tuesday, the guests of the Eastern Ohio Horticultural Society were provided vehicles, and started on a tour of inspection, under the leadership of I. N. Vail and Wm. Stanton.

The first plantation visited was that of Mrs. Deborah Stanton. Here were found three acres of Sharpless, Cumberland, Manchester, Crescent, and James

Vick, all in very good order, and gave evidence of what an intelligent and energetic woman can do. Like all other strawberry-growers around Barnesville, she prefers the Sharpless; but she also thinks that the Manchester is too valuable to let go at present.

James Steer's place was the next one visited. He cultivates about five acres of strawberries and ten of raspberries. The latter are principally Gregg and Shaeffer's Colossal. The healthy appearance and fruitfulness of the last named variety brought forth numerous remarks as to its value, some asserting that it is one of the most valuable for drying, the product bringing the highest price in the market. Others said that the fruit had been shipped to Chicago and brought a good price. These facts were new to those who had supposed that it was suitable only for home use. On the same place, and also on the adjacent farm of Wm. Stanton, some very fine cherries were seen.

A son of Mr. Steers has a basket factory of his own. It is constructed upon somewhat the same plan as an old-fashioned shingle-machine, and does very excellent work.

The next plantation visited was that of Mr. Lovejoy, where forty-three bushels had been picked from one acre at two pickings on two successive days.

Upon the farm of Hon. Samuel Hilles was found a new departure, as to varieties. He grows the Sharpless largely, but also the Jucunda and Wilson. He plants nine rows of Jucunda to one of Wilson. The Wilson has not run out with him, and he thinks the Jucunda the most valuable of all, because of its lateness. The Glendale he also finds to be profitable, as it is late, productive, and sells well in market. In answer to a question as to its quality, he said he did not know whether his customers ate the berries or made vinegar of them. He had one customer who bought a crate of Glendales and wanted more, and he has had a great desire to see that man ever since.

After an excellent dinner at the fair grounds, the party visited a small plantation owned by Mr. Hays. Mr. Hays has the reputation of being one of the most thorough and pains-taking strawberry-growers in the neighborhood. His best patch was a marvel of vigor and productiveness, the berries literally lying in heaps near the hills. It was the general testimony of those present, that they had never seen such fruitful Sharpless.

The present crop is the eighth taken from the same ground, being the second crop from the third planting. He keeps the plants in hills, or nearly so, manures moderately, but not heavily, cultivates thoroughly, and gets on an average about one hundred and fifty bushels per acre. Last season, the average was one hundred and seventy-five bushels. The ground that one apple tree occupied, is said to have produced fifty dollars worth of berries in one season.

John Scoles, one of the pioneers in fruit culture at Barnesville, has about sixteen acres each of raspberries and strawberries under cultivation. On the day of our visit, his shipment was one hundred and eighty-three bushels, which exceeded the daily shipment of the whole community in 1883.

The Nuzum Bros. are new beginners, but have earned the reputation of being among the best growers. They manure heavily, using as high as one hundred and sixty loads per acre, and judging by the appearance of their vines, the reward will surely come.

At the evening session, a fine collection of strawberries and cherries was shown. Many exhibitions, containing a greater number of varieties, have been made at other places, but every one present expressed the belief that no finer show was ever seen. The remark was frequently made, however, that finer berries had been shipped that day than were to be found on the tables.

REPORT FROM STARK COUNTY HORTICULTURAL SOCIETY.

CANTON, OHIO, June 7, 1886.

To the State Horticultural Society:

The Stark County Horticultural Society sends you greetings, and trusts that our Barnesville brethren will keep their large and luscious strawberries in the back-ground, lest you become surfeited and lose all inclination to taste some of Mollie Stark's berries, on Friday, June 11, at the residence of Squire Pontius, two miles north of Canton.

This being our annual "Strawberry Show," which never fails in bringing out a fine display of strawberries, to which you are all most cordially invited, and *urgently requested* to be present.

I send you copies of our May meeting which please distribute.

The Stark County Horticultural Society is in as good and flourishing condition as it has been at any time since its organization seven years ago. We never have less than 125 paying members on the roll, and sometimes as many as 150. Have monthly meetings at members' residences, and bad weather it must be, indeed, if the number in attendance is less than 100, and frequently we have as high as 250 to 300.

At all our meetings are fine displays of fruits, flowers, vegetables, etc. Indeed, this is one of the leading features of our meetings,—of course, I wouldn't count out those good dinners that our wives and daughters are so famous for providing.

The prospects for apples were never better. Pears not a half crop, very full last year. Cherries full crop; first for a number of years. Peaches, few budded; seedlings full, but not many trees. Grapes very full. Raspberries very full. Blackberries very full; never fuller; not winter-killed. Strawberries very full, but growers complaining of drouth, and praying for rain. Currants nearly all destroyed by currant worms; the season is from 10 to 15 days earlier than the average. Strawberries, home-grown, in market May 20. Ripe cherries, May 14.

J. F. NIESZ, *Sec'y.*

PEACH-YELLOWS AND BLACK-KNOT.

The inclosed communications have been received in response to inquiries about black knot on plum and cherry trees. More information is desirable about these destructive pests, but it seems generally conceded that there is probably no cure for them where they have once become established; and that the only known practicable remedy is prompt destruction of the infested trees.

—SECRETARY.

CHILLICOTHE, OHIO, June 7, 1886.

Mr. G. W. Campbell:

DEAR SIR: As regards Black-knot, will give my views of the origin and cure. Its first appearance was May, 1885. It seemed to be a fungus, and believing it would propagate by seed or spores, intended to cut and burn, but sickness prevented.

Some of the trees had hundreds of knots; others a few, while many had none.

As a rule, the more dense the groves, the more numerous the knots, while trees in open ground mostly escaped. Have seen but one or two new formations, but where the branch or twig was not killed, the disease has spread three or four inches above and below the old knot. By cutting beneath the knot, I find the inner bark discolored for three or four inches below, showing a preparation for next year.

Have twenty-five varieties of plums, including five or six native varieties.

The Black-knot is confined to the Damson, Blue plum, Muscle, and hybrids of the same.

The finer varieties and wild plums, also cherries, are free from disease. From observation, have concluded to cut the branch six inches below the knot any time before the sap rises the following year.

"Prove all things; hold fast that which is good."

Yours truly,

J. R. HURST.

ANTIOCH, MONROE COUNTY, OHIO, June 7, 1886.

George W. Campbell:

The Black-knot reached this place about seven or eight years ago. (Am not certain about the exact date.) It came from the north and spread slowly to the south and

west. Last summer, it had just reached a place twenty-five miles west of here in Noble county. It has been very destructive to plum trees, and worse on Morello cherry trees. Last summer it was much worse than it had ever been before.

The only remedy we have found is to cut off and burn. But few about here have tried to save their trees.

Queries: 1st. Has it ever disappeared in any place where it once got started?

2d. Has it ever been known to attack apple trees?

3d. Is there any variety of plums, except the Wild Goose that is free from it?

The "peach yellows" are not known in this section.

GEORGE WEST.

LAKE FORK, ASHLAND COUNTY, OHIO, June 7, 1889.

GEORGE W. CAMPBELL, *Secretary State Horticultural Society*:

DEAR SIR: The cherry and plum trees are badly affected with "black knot" in this and adjoining portions of Wayne county, especially the cherry, the old sour cherries being mostly affected. It looks very unsightly to pass a farm and see rows of cherry trees nearly all dead, and as full of "black knot" as trees are generally full of leaves. I wish there was a law compelling people to cut them down and burn them up.

Have not been able to detect any "yellows" in the peach as yet.

M. K. SIEBERT.

PEACH YELLOWS.

BY J. F. NIESZ, SECRETARY STARK COUNTY HORTICULTURAL SOCIETY.

I am happy to state that, after considerable inquiry among our people, I failed to find a single case of "peach yellows" in our county.

We have had no peaches of any account since the season of 1883.

We will, however, have a fair crop of seedling or native peaches this season, but very few fine or budded peaches, in consequence of the thermometer registering 18° below zero last winter.

"BLACK KNOT."

We have had the "black knot" on our sour cherry trees for nearly thirty years.

The Black Morello were the first to succumb. Ten or fifteen years later, the large, sour red cherries began to be affected. So at present there are no old, sour cherry trees in the county that are free from the curse.

The plum trees are also affected with the disease; however, in some localities they seem to be remarkably free from it yet.

The curculio is the greatest plum enemy we have to contend with, some failing year after year to save any of their plums, while a few others can raise big crops successively, without any interference by the "Little Black Turk."

I have in mind now a location about two miles square, which is considerably elevated, and wherever there are any plum trees about the premises, they are annually loaded with fruit; yet none of the owners have been wise enough to grasp the opportunity that lies within their reach, which would lead on to fortune. It lies within four miles of a city of over 20,000 inhabitants; is worth from fifty to one hundred dollars per acre, and that mostly for the coal that underlies it.

In this market, the Damson plum always brings ten to twelve cents per quart to the producer.

I believe that twenty acres of this land set to plums would, after coming into bearing, yield a greater annual net income than is now derived by all the owners from the soil.

P. S.—No remedies except cutting out or destroying affected trees recommended.

"BLACK KNOT."

Look out for the "black knot" on the plum and cherry trees, says the *Farm Journal*. These knots are caused by a vegetable parasite called *sphaeria morbosae*. It develops from spores which are wafted about by the wind. No tree is safe in the orchard where one tree is affected. When once affected, it will not take long for the whole tree to become useless. The only remedy for this evil is to cut off all the affected branches and burn them. Nothing short of burning will kill the parasite.

APPENDIX.

MISSOURI HORTICULTURAL SOCIETY.

The Missouri Horticultural Society issue a handsome volume of about five hundred pages, by their Secretary, L. A. Goodman, of Westport, Mo.

We extract from the proceedings some items of general interest, which follow :

SOME NEW APPLES.

The Society has brought out three very excellent apples in the last few years, and I believe we will yet find some apple just the thing we want for our own State. The first is the "Gano," a seedling found by W. G. Gano, of Parkville, Mo., a large, handsome, red apple, good bearer, and hardy. The apple has a bloom like the Lawver, and, although not the best in quality, it is a fair apple, very attractive to the eye, and will sell well ; good keeper, well worthy propagating.

The second is the "Rankins," brought into notice by Mr. H. C. Kirshbaum, of Tolona, Mo., a medium to large striped apple, very fine in quality, juicy and sprightly, good bearer, hardy, and good keeper. It took the first premium as a new apple at the meeting at St. Joseph, and came within one point of taking the premium at New Orleans. It is from seed brought from Kentucky by Mr. Rankins fifty years ago. It is worthy of propagation, and will become valuable in Missouri.

The third is called the "Loy," and was found at the county fair at West Plains, Howell county, Missouri, in October, 1885, and obtained through Mr. E. F. Hynes, of that place. This apple resembles the Willow Twig, is medium to large, extra good quality, good keeper, and tree said to be hardy and productive ; very valuable annual bearer. This apple took the premium as the best new apple at New Orleans.

The following is from Reports on New Fruits, by F. Lionberger, of New Florence, Mo. :

Red Bietigheimer is very highly spoken of here by parties that have seen it in Germany ; they say it keeps well there, but here, however, it is classed among fall apples, and I doubt whether it will ever amount to anything except to satisfy curiosity.

My partner, Mr. Gutemann, has come from the city of Bietigheim, where he was engaged in horticulture. He claims that the Green Bietigheimer is a much better apple and better keeper. However, new apples, in my opinion, ought to be well tested before they are introduced to the public. I think it would be better if no new fruits could be introduced except through the societies of the respective States.

Quinces.—Champion was killed to the ground, while R. Mammoth and Orange came through all right.

Apricots.—All the trees were killed, Russian and all.

Cherries.—E. Richmond, Late Duke, and Reine Hortense are in fine condition, but all the sweet cherry trees were killed.

Moore's Early and Worden grapes were recommended as the best grapes to plant for family use.

Delaware did well on high, dry land, especially when well fertilized.

BEST SIX APPLES FOR MISSOURI.

E. P. Henry, of Butler, Mo., in recommending best six varieties of apples for profit, and for the family, said : Without hesitation, then, I will say that my first choice of an apple for profit is Ben Davis ; second, Willow Twig ; third, Jonathan ; fourth, Grimes' Golden ; fifth, Minkler, and sixth, Hunts-

man; and I make this acknowledgment, that I never before left the Winesap out, even of the four best.

For the family varieties, would name Early Harvest, Sweet June, Sops of Wine, Lowell, Maiden's Blush, Red Streak, Fameuse, Grimes' Golden, Minkler, Jonathan, Huntsman, and Lady Sweet.

H. E. Van Deman, of Kansas.—The Ben Davis is the leading market apple, and is still being planted. Think we have one better in quality, and that is the York Imperial.

Henry Speer thinks that the Ben Davis is a good apple in quality, and is good enough to eat, at least for him; and the Ben Davis is the most profitable of, all of forty varieties. Would like to know if it would not be better to plant some summer and fall apples.

The Secretary names Ben Davis, Willow, Minkler, Jonathan, Grimes, and Rome Beauty.

For Montgomery county, best six varieties of apples:

For market—Ben Davis, Jonathan, Rome Beauty, Winesap, Grimes' Golden, and Huntsman.

For family.—E. Harvest, R. Astrachan, Maiden's Blush, Smylies' Red, Vandevere, Rawle's Janet, Winesap, Jonathan, Smith's Cider, Newtown Pippin, G. G. Pippin, and Pa. Red Streak.

Several similar lists were furnished, but all recommended planting Ben Davis for profit, in the proportion of 55 to 90 per cent.

REPORTS UPON STRAWBERRIES IN MISSOURI.

By Z. T. RUSSELL, OF CARTHAGE.

Chas. Downing.—Plant rusts, and is not productive, therefore not profitable.

Crescent.—Most productive and profitable by far of any sort yet tried.

Capt. Jack.—Had expected much of this variety; was a complete failure, except a few berries that were allowed to remain, of spring-set plants, which were very fine.

Cumberland.—Hardy, productive, large, and fine, but light colored and too soft for shipment; one of the best for home use.

Windsor Chief.—Almost as productive as Crescent; large, late, dark colored; valuable for home use and near market, but too soft for shipment.

Glendale.—Good crop of large, very firm berries, of dark color, and poor quality; late; good shipper.

Jersey Queen.—Largest and finest berries I ever saw, and very productive considering its size; good quality, but too soft for much handling.

Manchester.—Large, well-shaped berries; productive; pleases me very much; plant rather sensitive to heat and drouth, otherwise one of the most desirable in the whole list, for profit.

Miners.—First season's fruiting; hardy, very productive, large and fine.

A HARDY PEACH.

The Kilbourn, or Canada Iron Clad, is probably the hardiest good peach known. For an early large, peach, almost equal to the Early Crawford, and but a few days later, we have found the Wager to be a marvel of productiveness and hardness. But we would advise all who wish to try it to rely on budded trees rather than on seedlings. This "reproduction from the seed" has proved to us a rather uncertain business.

A DOUBTFUL OPINION UPON "THE YELLOWS."

"Dying with the yellows," said the individual in the seat next to me, as he pointed to a peach orchard near which our train was passing rapidly. "Dying with the yellows," exclaims the grower when he sees the leaves of the trees turn to that color. "Dying with the yellows." You hear it wherever peaches are grown, and see it in every paper which publishes fruit reports.

ILLINOIS STATE HORTICULTURAL SOCIETY.

The Illinois State Horticultural Society held its thirtieth Annual Meeting at Centralia, December 8, 9, and 10, 1885. The Society, by its Secretary, A. C. Hammond, of Warsaw, Illinois, issues a handsome and interesting volume of Transactions of the State and kindred Societies, of near 400 pages.

We make a few selections from the volume :

ORCHARD SITES.

Changed conditions are gradually working a change of opinion as to the best selections for orchard sites. Formerly it was thought that the more elevated and rolling grounds were the best; some think that this was an error. We do not think it was twenty or twenty-five years ago, but think it would be now, provided the lower grounds selected are susceptible of easy surface drainage. As what we are now saying has reference to the section in which we now are, we ought to remark that we have here two classes of fruit lands—prairie and timber—and it would certainly be an error to select the bottom lands in the timber for an orchard site in preference to the higher grounds. For a peach orchard, we should still prefer the higher grounds of either. High grounds on our prairies are not to be avoided, simply because they are high, for other fruit. The thing to be avoided is a too rapid drainage, and a thin and impoverished soil as a result. The increased attention given to the removal of all surface water of late years has, in my opinion, brought about the changed conditions referred to. The low lands of to-day do not contain more moisture than was contained in the higher, twenty or twenty-five year ago.

B. PULLEN.

STATISTICS OF THE CONDITION OF ORCHARD TREES IN ILLINOIS.

REPORTED BY SECRETARY HAMMOND.

Table showing the condition of orchard trees by districts :

	Northern Illinois.	Central Illinois.	Southern Illinois.
Per cent. of Apple trees dead and in a dying condition.....	56	45	15
Per cent. of Pear trees dead and in a dying condition.....	65	65	18
Per cent. of Peach trees dead and in a dying condition.....	95	82	48
Per cent. of Cherry trees dead and in a dying condition.....	54	49	27

Table showing the per cent. of an average fruit crop by districts :

	Northern Illinois.	Central Illinois.	Southern Illinois.
Per cent. of an average Apple crop.....	12	20	75
Per cent. of an average Pear crop.....	5	28	76
Per cent. of an average Peach crop.....	...	...	18
Per cent. of an average Plum crop.....	26	72	69

APPLE TREES UNINJURED.

In reply to the question, "What varieties of apple trees are uninjured?" Northern Illinois reports the following in the order named: Duchess, Snow, Red Astrachan, Willow Twig, Wealthy, Whitney No. 20, Yellow Bellflower, Tetofsky, Tallman's Sweet, Westfield Seek-no-further, Sops of Wine, Salome.

Central Illinois—Willow Twig, Red Astrachan, Duchess, Minkler, Maiden's Blush, Snow, Roman Stem, Tallman's Sweet, Grimes' Golden, Wealthy, Whitney No. 20.

Southern Illinois—Ben Davis, Wine Sap, Willow Twig, Red Astrachan, Maiden's Blush, Janet, Rome Beauty, Red June, Buckingham, Northern Spy.

VARIETIES THAT HAVE SUFFERED MOST.

In reply to the question, "What varieties have suffered most?" Northern Illinois reports Ben Davis, Dominie, Jonathan, Gilpin, Wine Sap, Rambo, Smith's Cider, Wagener, Maiden's Blush.

Central Illinois—Ben Davis, Wine Sap, Early Harvest, Domine, Little Romanite, Rambo, Janet, Baldwin.

Southern Illinois—Domine, Baldwin, King, White Bellflower, Smith's Cider.

PEAR TREES UNINJURED.

Northern Illinois reports the following pear trees uninjured: Flemish Beauty, Beurre d'Anjou, Tyson, Birkett.

Central Illinois—Birkett, Beurre d'Anjou, Tyson, Seckel.

Southern Illinois—Seckel, Duchess, Beurre d'Anjou.

PEAR TREES INJURED.

In Northern Illinois all varieties of Pear trees, except those above mentioned, are dead or dying.

In Central Illinois, Howell, Bartlett, and Madeline are badly injured.

In Southern Illinois, Bartlett, Mt. Vernon, Clapp's Favorite, Winter Nelis, are badly injured.

PEACH TREES.

In Northern Illinois all varieties of Peach trees are dead.

In Central Illinois a few may bear another crop.

In Southern Illinois, Seedlings, Red Clings, and White Heath are but slightly injured, while Smock, Salway, and Early and Late Crawfords, are badly hurt.

CHERRY TREES.

In Northern Illinois nearly all Cherry trees are reported killed; a few English Morello may bear another crop.

In Central Illinois one-tenth of the correspondents report the Early Richmond in a fair condition; all others killed.

In Southern Illinois, Early Richmond, May Duke, and Reine Hortense are uninjured; while Early May, Gov. Wood, Elton, Black Eagle, Black Tartarian, and Yellow Spanish suffered most.

CONDITION OF ORCHARD TREES.

In Northern Illinois the condition of orchard trees that will finally recover from the present injury, is reported as follows: 15 per cent. good, 10 per cent. fair, 75 per cent. unsatisfactory.

Central Illinois—30 per cent. good, 35 per cent. fair, 35 per cent. unsatisfactory.

Southern Illinois—48 per cent. good, 24 per cent. fair, 28 per cent. unsatisfactory.

CAUSE OF DEATH OF FRUIT TREES.

In Northern Illinois the cause of the death of fruit trees is attributed to extreme cold, insects, pasturing, neglect, and lack of adaptation of varieties to soil and climate.

In Central Illinois, to extreme cold, sudden changes of temperature, insects, starvation, deep snowfall on unfrozen ground, and severe freezing immediately after, and blue grass sod.

In Southern Illinois, to insects, severe cold, want of proper drainage and cultivation, starvation, neglect.

LOCATION OF ORCHARDS.

Northern Illinois, in reply to the question of "Location of Orchards," reports as follows: 50 per cent. high and dry, 15 per cent. medium, 15 per cent. northern slope, 10 per cent. low and moist, 10 per cent. clay, timber soil.

Central Illinois—45 per cent. high and dry, 35 per cent. medium, 20 per cent. low and moist.

Southern Illinois—48 per cent. moist—well drained, 36 per cent. high and dry, 16 per cent. medium.

SUMMER APPLES.

Northern Illinois recommends the following as the best three summer apples: Red Astrachan, Duchess, Sops of Wine.

Central Illinois—Red Astrachan, Duchess, Sops of Wine.

Southern Illinois—Red Astrachan, Early Harvest, Red June.

FALL APPLES.

Northern Illinois recommends the following as the best three fall apples: Snow, Maiden's Blush, Wealthy.

Central Illinois—Maiden's Blush, Rambo, Snow.

Southern Illinois—Maiden's Blush, Rambo, Pennsylvania Red Streak.

WINTER APPLES.

Northern Illinois recommends the following as the best six winter apples: Willow Twig, Roman Stem, Pewaukee, Tallman's Sweet, Salome, Northern Spy.

Central Illinois—Willow Twig, Jonathan, Roman Stem, Minkler, Grimes' Golden, Yellow Bellflower.

RUSSIAN APPLES.

None of the Russian apples but Red Astrachan, Duchess, Tetofsky and Alexander have been fruited, but others are being tested, from which good results are expected.

NEW VARIETIES.

No new varieties of any special promise are reported, although a number are under the eyes of our most careful horticulturists.

The fearful mortality among orchard trees in the Northern and Central portions of the State, which this report indicates, calls for a prompt and careful examination of the causes that have brought it about. When we better understand the question of location, distance to plant, modes of cultivation, and the necessity of keeping the soil in a high state of fertility, the question will be nearer a satisfactory solution than it now is.

ADDITIONAL REPORTS.

The area of injury done to orchards, so far as I have been able to ascertain, is co-extensive with the area of the heavy snow which fell in the first half of December last on the unfrozen ground. Owing to the extreme cold weather which followed, this snow did not go off for three weeks. The fact that the greater injury was done to winter varieties which bore full crops of fruit would seem to indicate that the late growth which these trees made in their effort to recuperate, induced a condition of the sap and wood which proved fatal to them. With the roots in a warm soil and the branches in a temperature ranging from zero to twenty below, the results were as I have stated.

Varieties of trees that bore no crop during 1884, and which are regarded as less hardy, came through the winter in a healthy condition. If my deductions are correct, and I believe they are, we would not be justified in saying a variety was tender because it suffered last winter.

From Mattoon south to Centralia I saw many young orchards, and talked with a number of farmers who contemplate planting quite extensive orchards in the spring—thus showing that they believed apples a paying investment. Ben Davis, without doubt, leads all other varieties, with a second choice for Rome Beauty, Willow and Winesap.

Mr. Augustine.—I came here hoping I might learn of some new varieties of apples that were hardy in Northern Illinois, outside of Duchess, Red Astrachan, Walbridge, Wealthy, Whitney No. 20, and Pewaukee. These have proved to be hardy, but we want others.

The Mann apple is said to be hardy, but it was badly killed in the nursery last winter, much more so than Ben Davis. The Winesap and Janets also were killed in the nursery.

FOREST-TREE PLANTING.

* * * * * The influence of forests on climate is not well understood. It is asserted by some that they have an immediate effect on rainfall, tending to a greater quantity and an evenness in distribution. Positive proofs of this are wanting; hence, it is denied by many. That forests equalize the flow of streams and rivers will not be denied. But the system of drainage necessary in farming sections acts in the same manner and to a greater extent.

I do not wish to antagonize the planting of forest trees. There are many reasons why they should be planted. There is the same necessity for wind breaks, where there are none, that there ever was. A grove for a sun break

for stock is highly profitable, and is appreciated about as many days in a year as a wind break.

There are also local demands on every farm sufficient to make a forest plantation of much profit. Many of these demands could be supplied during the thinning out process necessary in a grove. These uses are likely to be for posts, fence boards, poles for sheds, cribs, firewood, etc. On our own place we would feel a serious loss were we deprived of our small forests.

What to plant, will depend upon the purposes for which the planting is done. The Catalpa has many friends. The Black Walnut is used very largely in the West, but this is in a great measure owing to its easy propagation, though for the purpose of lumber it is as valuable as any. The European Larch and White Ash are proving among the most valuable with us. But the former does not seem to be well adapted to the careless amateur's hand, especially in its early stages of growth. I presume for this reason it is not more popular. But it is to be commended for its hardiness, durability, straight, and rapid growth. The Ash is particularly well adapted for purposes of local demand. But it is not an extra rapid grower, and must be trimmed to form straight growth. In many respects, there is no substitute for the Osage Orange. Its habits of growth, however, make it compulsory upon the grower to give it considerable attention. If planted about four feet apart each way, and with due attention to trimming, it is probable a good trunk will be formed. There is no wood known that is so durable. Tales of its durability sound fabulous. This quality is in some measure due to its being so impervious to water; hence the disintegration which is caused by the action of heat and frost on wood saturated with water does not take place. An osage wagon felloe of eight years' seasoning was placed into water with an oak felloe ordinarily seasoned, to note absorption of water by each. They were carefully weighed before and after. After soaking twenty-four hours the oak showed a gain of two and one half ounces, while the osage showed no apparent gain.

It is this characteristic that makes the Osage so valuable for wagon wheels. For purposes requiring a wood of so great a durability, I know of nothing else to recommend.

GRAPE-VINE PROTECTION IN ILLINOIS.

Grape vines, where protected or even thrown on the ground, bore an immense crop; where left on their supports, almost an entire failure, and in many cases loss of the vines as well.

The only kind of grape that passed through the winter unprotected and bore a full crop was the Clinton; most other kinds left on the trellis were killed by the cold. All vines on the ground so that the snow covered them bore a heavy crop. Martha, Brighton, Concord, Prentiss, Salem, and Worden have done best in the vicinity of Chebanse.

REPORT OF COMMITTEE ON NEW FRUITS.

Your Committee on New Fruits beg leave to report that they have carefully examined the fruits on the table, and find many new ones of great promise, especially apples, mostly brought here from the Southern States, and we think some of them may be what we are looking for, as they are large, high colored, good keepers, and very good quality.

Egyptian Queen.—From W. R. Crain, of Villa Ridge: A very large, bright yellow apple, with beautiful red cheek, sub-acid, quality very good, in season from January to May. Tree said to be a strong grower; moderately productive; thought well worthy of trial.

Sparks.—About like Ben Davis in size and shape, greenish yellow, yellow-fleshed, mild sub acid. Tree, a vigorous, upright grower, immensely productive, and very much liked by those who have grown it.

Pickett.—Color of Willow, but larger, rich acid, fine grained, very best quality, season same as Ben Davis. Tree, upright grower, medium; early and abundant bearer; very promising.

Crain's Spice.—Dull red, larger than Winesap, spicy acid. Tree, an early and abundant bearer; season same as Winesap.

Cache.—Supposed to be a seedling of Pryor's Red, about the same size and shape, but more highly colored, sub-acid, very good; has the appearance of being a good shipper.

Terrell.—In color and size like Ben Davis, better in quality, but coarse-grained, equally as early and abundant bearer.

Fink.—Greenish yellow, medium size, quality excellent, fine grained, very late keeper, and abundant bearer; should be extensively tried.

Middleton.—From Mr. Webster, of Centralia: Grown by J. D. Middleton, Iuka, Ill.; greenish, partly red, very good tree, a vigorous grower, and early bearer; enormously productive.

Royal Pippin.—From J. W. C. Gray: Striped red and yellow, acid and coarse grained; recommended by the grower on account of its extreme hardness, and may, on that account, be valuable in the extreme north.

Red Winter Pippin.—From T. W. Thompson, of Makanda: Bright red, medium size, mild sub-acid, fine grained, quality very good. Tree, an early and very abundant annual bearer, foliage thick and heavy; very promising.

We find on the table an apple under the name of *Puckatuck*, which we believe to be Rome Beauty; at least we cannot see wherein it differs from that variety.

Niel's Keeper.—From R. W. Niel, Clinton county: Striped red, medium to large, very good, flesh fine grained, with a peculiar, pleasant flavor; said to be an early and very abundant bearer, and late keeper; highly spoken of by those who are acquainted with it.

IMPORTANCE OF FOREST-TREE PLANTING.

* * Already a portion of Northern Michigan looks like the desolation of chaos. A thousand years will not again supply the earth that has been washed from her ravaged hillsides. The comparatively few remaining "timber lots" yet standing in some of our Eastern States are being cut down to help eke out the livelihood of the family. The spring freshets come now in many of the New England States with a power and terror formerly unknown. The rural population are either moving to the cities, or migrating westward in search of more fertile lands. Even the soil of our own fair State, in many localities, is deteriorating. Bringing the subject home, does forestry mean any thing to us personally? It does, and very much. Allow to me to say this: If any farmer has within his premises an acre or two, or a half dozen acres of land

poorer than the rest, *that land will recuperate under timber cultivation as it will with no other available treatment.* Land that is growing trees loses no strength, but continually gains in all the essential elements of the soil, and these few poorest acres will become to your children double the value, acre for acre, of all your farm contains. If your land is low and a trifle wet, an acre planted to black walnuts, in thirty years at the lowest estimate, will be worth one thousand dollars. Full grown individual trees, stump and all, often sell for that amount, and a far greater sum is often realized when the best portions are cut into veneers. The ash is also a very valuable tree, so is the common and the sugar maple, and the beautiful wild cherry is becoming nearly extinct. It will pay to grow any of these trees. Plant and care for them intelligently, and your children will rejoice in the harvest. It is pretty tolerably safe to state that within thirty years from the present time, timber of all kinds will double in value. According to the census of 1880, there are in the United States 27,000 establishments for the cutting and manufacturing of lumber, and these manufactories employ 148,000 hands. This immense army of human locusts mow down annually between seven and eight million acres of timber, not one-fiftieth part of which is ever replaced. Something has got to be done soon, and done in a systematic way, too. The Government of the United States is behind all other governments of the world in the consideration of this vital topic.—*A. S. Cutler.*

KANSAS STATE HORTICULTURAL SOCIETY.

The Kansas State Horticultural Society have issued their report for 1885, containing the proceedings of the fifteenth Semi-annual Meeting, and the nineteenth Annual Meeting, held December 1, 2, and 3, and edited by the Secretary, G. C. Brackett, Lawrence, Kansas.

We make a few extracts from this interesting and valuable report:

Kansas is evidently after the tree peddlers with very sharp sticks, as will be seen by the following law for the

PUNISHMENT FOR DECEPTION IN SALE OF FRUIT TREES, ETC.

AN ACT to punish misrepresentation and deception in the sale of fruit, shade, or ornamental trees, vines, shrubs, plants, bulbs, and roots.

SECTION 1. *Be it enacted by the Legislature of the State of Kansas:* That any person or persons who shall misrepresent, deceive, or defraud any person or persons in the sale of any fruit, shade, or ornamental tree or trees, or any vine, shrub, plant, bulb, or root, by substituting inferior or different varieties, or who shall falsely represent the name, age, or class of any such fruit, shade, or ornamental tree or trees, or any vine, shrub, plant, bulb, or root, shall be guilty of a misdemeanor, and on conviction be fined not less than ten dollars nor more than two hundred dollars, or by imprisonment in the county jail not less than thirty days nor more than six months, or by both such fine and imprisonment, and shall be liable to the party or parties damaged or injured thereby in treble the amount of all damages sustained, to be recovered in any court having jurisdiction thereof.

SEC. 2. This act shall take effect and be in force from and after its publication in the official State paper.

Approved February 19, 1886.

SUCCESSFUL PEAR-GROWING.

By T. L. WILLIAMS, OF OSWEGO, KANSAS.

* * * * * It always seemed strange that pear trees planted in land having a clay base, should fail, as has been claimed by many growers. Forty years ago my father planted an orchard upon such ground, which is doing well this day. I can hardly, from my experience, recommend sandy land for such purposes. Twelve years ago I planted a dozen trees, which have been productive ever since. I have each year added to my plantation, until now I have nearly five thousand trees in orchard form, and largely on a clay base; and so far these have proven satisfactory. I have suffered less failures with this fruit than with most of the other classes.

As to blight, as correctly understood, I know of none. All diseases of the pear are commonly classed as "blight." Five years ago we had heavy rains, followed with a heavy snow storm in November, while the trees were full of sap. Many trees were pronounced killed, but they have grown fine crops each year since. The pears worked on quince root (called dwarfs) become root-bound and die. Others have the fibrous surface roots killed by a severe freeze, and also die. In each instance they are said to have blighted. Late fall cultivation produces a condition which is liable to injury in winter, and should not be practiced.

We are advised not to manure pear trees. I have used at the rate of a hundred wagon-loads to an acre; of course, such trees were stimulated into a very strong growth. But by repeated "pinching in," they were kept in a healthy condition. Those not thus treated, winter-killed. It is not so much the manuring of trees, as it is the treatment given them after being manured, that causes injury. I have cultivated my trees, but not so much as I desired to, for want of time, and those well cultivated have done the best.

I have used successfully, Bartlett, Angouleme, Clapp's Favorite, Vicar, Howell, Louise Bonne of Jersey, and Flemish Beauty.

NEW SEEDLING GRAPE.

Mr. H. E. Van Deman, of Geneva, Kansas, reports upon a new grape, as follows:

The Jewel is the name of a new grape originated by Mr. John Burr, of Leavenworth. From samples seen at Kansas City Fair, I judge it to be worthy of trial when it is put upon the market. The bunch and berry are both rather small. The skin is black, and very thin. The flavor is fully equal to the Delaware, or even better. Its season is very early, and if the vine proves hardy and productive, it will certainly prove a valuable addition to our list of early grapes.

SMALL FRUITS IN KANSAS.

B. T. Smith, of Lawrence, Kansas, makes the following report upon the different varieties:

Strawberries.—There are many kinds of strawberries, but few in comparison to the number are profitable to grow for market. Not a few that have been heralded in the East as the best strawberry for all purposes, have proved almost fruitless on our soil. Then there are those like the Crescent, Capt. Jack, Miner's Prolific, Windsor Chief, Glendale, Jersey Queen, Mount Vernon, and others, that are adapted to all classes of soil, and are always welcome. Whoever plants the Crescent, can do so feeling entire confidence in a successful result. The rich-flavored Chas. Downing will please the taste of most people, and be a continual reminder of that noble-minded horticulturist whose name it bears. Capt. Jack is one of the best shipping berries for a distant market. Miner's Prolific is a universally admired variety. Windsor Chief is as near to the Crescent in productiveness as any variety grown. Sharpless, though its fruit is large, yields light crops. Mount Vernon is not firm enough to be shipped safely a long distance, but proves excellent in flavor; from this we picked our last berries for the season. Cumberland is a large berry; plant productive on some soils, and when grown in narrow rows. The berry is quite soft, therefore should be used for the home market. Jersey Queen is a grand berry

in size and flavor, and its merits have not been overrated. The flesh is tender, but firmer than the Cumberland, and of better flavor; a strong grower. Connecticut Queen is much like the Chas. Downing in plant, only a stronger grower, and more productive. Its color is the only objection for a market variety—being a dull brick-red. Bidwell, a beautiful berry, of fine flavor; but not sufficiently productive to be a profitable market berry. I have grown it in hills and in matted rows, but it fails in amount of the product. Finch, a handsome berry, but not productive. I have fruited the James Vick two seasons. Its yield of berries, in the season of 1884, was astonishing. This season, however, it disappointed me; but I am not ready to condemn it; will give it one more trial. The Manchester, on my soil, rusts badly. The berries are large enough, but in taste they are the poorest of any berry on my premises. The Glendale has never disappointed me. Its fruit is not of the best, but it is handsome, productive, late, and firm enough to ship to New Mexico. My first fruiting of the Atlantic was the past season, and I can truly say that it is fully equal to the claims set up for it. It is about as productive as the Chas. Downing.

Raspberries.—The Cuthbert was seriously injured by the winter of 1884, but in the winter of 1885 it was not injured in the least. The Reliance is a dark-red berry, inclined to crumble when picked; second rate in taste; bush perfectly hardy. The Hansell is the earliest red raspberry; second rate in flavor; bush not near as strong a grower as the Turner, Thwack, or Cuthbert. The berries of the Superb are very large, and about as dark as the Philadelphia, but it crumbles badly when picked. The bush is perfectly hardy, and not much inclined to sucker. As a market berry it will not attain to much popularity. Shaeffer's Colossal is the strongest grower, red or black, on my grounds. It is very productive; fruit dark red with a purplish tint, and second rate in taste. If consumers can be educated to like the taste of the Shaeffer, it will become a great favorite among raspberry growers. The Caroline is the most beautiful raspberry on my grounds, and, to my taste, the best. The berry is a pale orange or buff color, with pinkish tint, and as large as the Souleigan; the bush is perfectly hardy, and as strong a grower as the Hansell. The Crimson Beauty I have fruited but one season; the bush is a strong grower; berries scattering and tender. The Marlboro I planted last spring. The first season's growth is very fine. I am inclined to think it will equal the claims made for it by the introducer.

Blackberries.—There is a strong desire abroad for a better blackberry than we now have. The Kittatinny is large enough, but it is not hardy; then, it is liable to a disease called rust, that may appear at any time or place. The Snyder is perfectly hardy, but it is not large enough to suit the demand. The Taylor is thought to be an improvement on the Snyder in size, but it is not as productive. The Early Harvest is a good, early berry, and safe while there are gentle breezes from the south; but the first Alaskan or Greenland blizzard destroys a summer's growth of wood, or a crop of fruit. Hence, with these ills in view, there is no blackberry now in sight as trusty as the Snyder. If some enterprising fruit-grower can produce a native, hardy blackberry as large or larger than the Kittatinny and productive as the Snyder, a long-felt want will be supplied.

UNHEALTHY APPLE TREES.

The unhealthy condition of the apple tree, too often found in Eastern Kansas, may be summed up in a single sentence: the prolonged, plethoric growth in the latter part of the season; and as much of the damaging effect is in the trunk of the tree, it seems but reasonable that we should seek to strengthen that part of it. To do this, we must commence with the seed. These should be selected from the hardiest kinds (or better, from seedling trees), and planted in moderately fertile land, avoiding all stimulating manures. Plant in nursery rows, and grow them until two years old; then select such as give evidence of hardihood, and transplant to the orchard rows. In selecting, reject all such as have a tendency to form strong tap-roots, or cut all such roots back as much as they will bear. When the trees have attained to the necessary growth, top-graft them on the trunk, or in their branches with such varieties as are desired to be grown.

In seeking a site for an orchard, southern exposures should be avoided. I would select in the following order of preference; viz.: northwest, north, or northeast; though an exposure towards the east is not to be discarded when the others mentioned are not available. On the north side, in eastern Kansas, will be found the thinnest sub-soil, which is an important item in regard to a healthy growth, and which is conducive to longevity.—PROF. F. HAWN, of *Leavenworth*.

ARE SEEDLING TREES HARDIER THAN THOSE PROPAGATED BY BUDDING OR GRAFTING?

The question has been often asked, "Are grafted or budded trees as healthy and capable of enduring the severity of our climate as seedlings?"

While this form of inquiry is that commonly used, and in conversation may be understood, it is erroneous, as it implies that there are two *classes* of trees, having peculiarly and differently-constituted properties, which is not true, as all varieties under cultivation are seedlings; therefore, to properly reach the object of the question, it should be re-formed as follows: "Are varieties propagated by budding or grafting as healthy and as capable of enduring the severity of our climate as those propagated by seeds?" * * *

If the tree from which the cions or buds are taken is known to be hardy, and they are worked on known hardy stock, then there is no reason to doubt that such trees will be hardy also, when grown under similar conditions of the parent tree. But if the propagation is worked on a lot of promiscuous, untried seedling stocks, then there is no reliability in the hardihood of the propagated tree, for, as has been shown, seedlings are both tender and hardy, and that the term seedling does not imply in any sense a degree of hardiness in the plant.

If the process of budding or grafting is properly conducted, the union becomes complete, and the circulation of sap will pass through unobstructed, as in other portions of the tree. No material derangement of the functions will occur, and Nature continues her work of enlarging and building up the structure, by the addition of annual layers over this as in other parts of the tree. The process of propagating many classes of plants by cuttings, and even layering, is on the same principle, and does not excite the question of impairment of their physical conditions of health and hardihood. Says the late Dr. Warder, "A graft is nothing more than a cutting helped, and if a plant grown from a cutting is hardy, why should its growth be any less so, when helped by being inserted into a tree or root?" On this point I would call attention to the following facts. The Rawle's Janet, Winesap, and Ben Davis—and I might enumerate hundreds of other varieties—have been propagated from fifty to one hundred years by such methods; or the Roxbury Russet, which dates back through two centuries; Rhode Island Greening and Baldwin, a century; or the famous Bartlett pear, which was introduced to this continent over one hundred years ago—all have been handed down from generation to generation through such systems of propagation, repeated thousands, yea, millions of times, and we find them to-day true to their kind, and so far as propagation is concerned, as healthy in tree as at any period of their time, considering the respective age of trees. If such process even *slightly* impaired the physical strength and vigor, would they not under the so oft repetition have been worn out long ago?—G. C. BRACKETT, *Lawrence, Kan.*

DESTRUCTION OF FORESTS.

What are we doing to-day? Stripping the country of timber in every direction, with a recklessness and a wastefulness of methods and an utter indifference to either the teachings of the past or the known wants of the future, that seem madness. Not content with satisfying our own demands, we are exporting large quantities of lumber which should remain on the stump. Farmers clear more land than they can cultivate, in the face of a wealth of open public

domain. We burn and trample down and otherwise destroy thousands of acres of vigorous shoots every year. Private estates are wasted; public lands are robbed. The Northern States have about twelve years' supply of timber, at the present rate of cutting. When the same pressure and exhaustive processes are brought to bear on the South, the forests are doomed in seventeen years. An equivalent of fifty thousand acres of the best Wisconsin timber-land is cut every year, to supply Nebraska and Kansas alone. Ohio has not a merchantable walnut tree in the State, and her Governor officially announces that two hundred years will scarcely make good the ravages of the last half century. The forest crop of the United States for 1880 was estimated at \$700,000,000—almost entirely denuding not less than ten millions of acres. Wood is used for fuel where we should use coal; for shoe-pegs, where we should use metal; for fences, where we should herd or soil our cattle (the fences in Ohio are said, by competent authority, to be worth more than all the cattle); for telegraph and telephone poles, when the wires should be under ground; for city walks, where we should use brick or stone or asphalt; as pulp in paper, thereby giving us cheapness at the expense of both durability and comfort; for railroad fencing, at a cost of about eight hundred dollars a mile, only to be buried in winter and burned in summer—when a live fence would cost far less and do far better work. In these, and in a hundred other ways, all avoidable, and most of them inexcusable, we waste our substance. A clever statistician has estimated that when our inheritance has been exhausted, the merchant marine of the world could not carry us lumber as fast as we now use it. This, too, remember, is at the close of the first century of our national existence; when we have a population of but about sixteen to the square mile. What will be our condition at the close of the next century, if this recklessness continues? What shall we do about it?—JAS. H. CANFIELD, *Kansas State University*.

THE EFFECT OF FORESTS ON TEMPERATURE AND MOISTURE.

Dr. Ernst Ebermayer, Professor of Forestry in Bavaria, states: "For five years, observations have been made in the kingdom of Bavaria, at seven different points, respecting the influence of forests on the temperature and moisture of the atmosphere, on the evaporation of water, and on the quantity of rainfall, etc. The facts are based on five thousand different observations, made during the years 1868 to 1872, with the help of instruments most ingeniously constructed for that purpose. With these, twice every day, at fixed hours, and at all seven points, the temperature of the soil was measured for comparison, in the forests as well as the open fields, at the surface and at a depth, respectively, of one-half, one, two, three, and four feet. According to these, the mean annual temperature of the *forest soil* is on an average, 21 per cent. lower than that in the open fields, and the mean annual temperature of the *atmosphere in the forest* is on an average, 10 per cent. lower than that in the open fields."

In regard to the effects of forests on the general health, Hon. H. Seymour says: "The effects of forests upon the general healthfulness of the State is great. The philosopher Boyle long since stated that in the Dutch East India Island of Ternate, long celebrated for its beauty and healthfulness, the clove trees grew in such plenty as to render their product almost valueless. To raise the price of the commodity, most of the spice forests were destroyed. Immediately the island—previously cool, healthy, and pleasant—became hot, dry, and sickly, and unfit for human residence." It is known that the general

clearing away of forests in this country has had a tendency to raise the temperature in summer.

Dr. J. D. Hooper, of the Royal Kew Gardens, says: "The presence of forests plays a most important part in storing the rainfall, and yielding up gradually to the streams a continuous supply of water. Moreover, the rain is retained by forests on the surface of the ground; it gradually permeates to the subsoil, and so feeds the underground water-bearing strata upon which springs and wells must eventually depend."

AMERICAN ASSOCIATION OF NURSERYMEN, FLORISTS, AND SEEDSMEN.

The American Association of Nurserymen, Florist and Seedsmen met at the Agricultural Department building, Washington, D. C., from June 16 to 20, 1886. The list of the new officers elected is given in our news columns. A strong effort was made to elect Herbert Myrick as Secretary instead of D. Wilmot Scott, of Galena, Ill., who was re-elected.

A great lack of system and proper arrangement marred the meeting, which resembled an assemblage of school boys for fun, rather than a convention of men for business purposes. From 400 to 500 members were present, and 27 States were represented by Vice-Presidents. Many had traveled long distances, and it was hardly worth while to go to so much trouble and expense of time and money to learn so little. The young members who hoped to learn something which would be of use or profit to them on their return home, were especially disappointed. One good thing the Convention did—and that was outside its legitimate business—it passed a strong resolution in favor of the Oleomargarine Bill now before the Senate.

Chicago was selected as the place for holding the meeting in 1887:—*Rural New Yorker*.

OFFICERS ELECTED.

The following officers were elected for the ensuing year:

President, C. L. Watrous, of Iowa; First Vice-President, M. A. Hunt, of Illinois; Secretary, D. Wilmot Scott, of Illinois; Treasurer, A. R. Whitney, of Illinois; S. D. Bear, of Dayton, Vice-President for Ohio.

PEACH YELLOWS.

A series of experiments have for some time been carried on by Professor D. P. Penhallow, at Houghton Farm, to discover the cause of, and remedy for peach yellows. The conclusions reached are:

That peach yellows is not caused primarily by fungi or parasitic plants, although they may accompany and aggravate it by their attacks on the plant weakened by disease; nor is it caused by too much dampness or heat in the atmosphere, nor by unseasonable frosts or excessive winter cold, nor by want of proper drainage in the soil, nor by the use of fermentable stable manure. The primary cause he considers to be a deficiency in the soil of certain food-constituents, especially potash and chlorine, which are supplied in the well-known German potash salt, muriate of potash.

The most striking symptoms of the disease are—unusual features in the cellular structure and contents, which are evident under the microscope only; an

excess of lime in wood and fruit, and deficiency of potash and chlorine, which can be detected only by chemical analysis; premature ripening of the fruit; smaller leaves, with a red or yellow color in place of the usual green; a dark and parched appearance of the bark on the main limbs. The disease appears gradually, first on young branches, from which it spreads over the whole tree; it can be detected by microscopic examination of the cell-structure and contents, in advance of the appearance of any outward symptoms; of these he considers the premature ripening of the fruit and an unnatural color and flavor as the most important.

In the way of possible remedies, use stable manure with caution; trim off diseased branches as far as possible without too seriously mutilating the tree, and cultivate carefully. Apply the following mixture of commercial fertilizers: 25 pounds kieserit, 100 to 150 pounds muriate of potash, and 450 pounds dissolved bone-black, at the rate of six to nine pounds of the mixture to each tree; if the trees are badly diseased, add more muriate, about four pounds to each tree, in spring before growth begins, and in the fall. Spade the ground as far as the roots extend, mulch with the inverted sod or straw, and apply the fertilizer on this mulch, thus avoiding too near an approach to the roots. The evidence of this theory of the cause is found partly in the cures that have been effected by this treatment with muriate of potash. The remedy is a simple one for so destructive a disease, and is well worthy of careful trial by all whose peach orchards are attacked by it.

NEW REMEDY FOR GRAPE MILDEW.

This remedy has been applied with remarkable success in Italy, where it was recommended by the department and schools of Agriculture. Their articles are too long to give you a complete translation of them. They all agree, however, in reporting the most astonishing success of the new remedy.

This remedy consists simply of a lime wash or "lime milk," as the French call it, which is prepared in the proportion of about two and one-half kilos (about five and one half pounds) of fresh lime slacked in 100 litres (twenty-six and one-half gallons) of water. With this liquid the vines are sprinkled abundantly, and from the middle of May until the middle of August this operation is repeated five or six times.

With this mixture no special care need to be taken, as it contains nothing that is injurious to health, and even if some of the lime should still adhere to the grapes when they are ripe, this could be easily removed by washing the fruit in water.

In speaking of the results of the treatment Prof. Velicogna says:

"In every row of vines which had not been limed, but had been sulphured energetically and at several times, on each vine and on each cane not limed, the *Peronospera* (mildew) had made such ravages, as I have never seen before in our country. The 10th of the month, September, four-fifths of the leaves were lost. On some vines some canes had no trace of foliage left, the grapes are few, badly nourished and quite green, and the shoots of this year are short, sickly and puny.

All the rows of vines, every plant, every cane, which from the middle of May to the middle of August has been limed five or six times, are completely exempt from the *peronospera*; not a trace of the disease. The vines have conserved all their leaves, whitened by the lime, but large and fully formed, and of a dark green color when they are washed. As everywhere else, there

are not a great many grapes, but the bunches are fine, well developed, well nourished and black as ink."

Now an yone who knows how some of our finest grapes, the Delaware for instance, suffer from the mildew in unfavorable seasons, how in many sections they cannot be grown at all for this reason, will appreciate the high value of this discovery of a simple and practical remedy, and its importance if it should prove equally efficacious here.

We propose to make thorough experiments with it next season, and I would strongly urge upon all of you who are interested in the grape and who may have suffered in your vines from the ravages of mildew and rot, to give the new remedies a fair trial, remembering, however, that the efficiency of any remedy depends entirely upon its timely and thorough application. Life and health permitting, I hope we may be able to compare notes, and report favorable results at the time of our next annual winter meeting.—G. E. MEISSNER, in *Rural World*.

REMEDY FOR GRAPE-ROT.

A writer says: "I have reason to believe that copperas will prevent the grape rot. In a small vineyard in Massillon, O., where a quart of copperas to the square rod had been sown in July for three years there was no rot, while other grapes in the same neighborhood have rotted more or less every year. They formerly rotted in this vineyard."

MILDEW DESTROYER.

Sulphide of potash has proved in our practice all that has been claimed for it by the English press as a destroyer of mildew on roses, chrysanthemums and some other greenhouse plants. A quarter of an ounce dissolved in a gallon of water and thrown on the affected foliage with a fine-rosed syringe will wholly destroy the fungus, and the leaves will not be injured.—*Vick's Magazine*.

MANURING THE GRAPE-VINE.

Capt. J. B. Moore addressed the New England Farmers' Club on the subject of "Grape Culture" at a recent meeting. From the report of the Massachusetts Ploughman we make the following extract:

"As far as manuring is concerned, any land that is rich enough to bear forty bushels of corn to the acre is rich enough to grow grapes. As far as my own course is concerned, I have not used manure after planting. I have used applications sometimes of bone and ashes, and sometimes of bone and potash salts, with occasional plaster of paris mixed with it, because the grape requires more or less sulphur in the soil; the plaster of paris is the cheapest way you can get it. It is sulphate of lime, and does not cost much. You can buy a ton for five or six dollars, and it is as good an application for that purpose as anything that I know of. The reason why you don't want to apply animal manure largely to your grapes is, that it induces a rank, coarse growth of wood and foliage, which is unfavorable to the production of fruit. You want a fair, moderate growth of wood and that is all. You want a medium sized wood.

The cane should be about the size of your little finger, and it will bear larger bunches and more of them than if it is three times as large. You want to have them well ripened. Stimulating the vine by animal manure makes it grow until late in the fall, and the fruit will not ripen as well. The fruit buds do not thoroughly develope until the wood is partially ripe. I think you can make a much stronger fruit bud by moderate manuring than if you put too much animal manure."

SCRAPING AND WHITEWASHING THE BARK.

J. J. Thomas, of Union Springs, N. Y., writes to the *Michigan Horticulturist* as follows:

"A reason often given why the rough bark of trees should be scraped off and why a thick coat of whitewash should be applied is that this treatment will kill insects. Before resorting to either of these processes, with the hope that they will prove an effectual remedy for insect troubles, it may be well to inquire what insects make their home in the rough bark of trees and perpetuate their species there. The curculio does not, but inhabits the soil beneath the trees, for at least a part of the season; the orchard caterpillar deposits its eggs on the young twigs; bark-lice choose smooth rather than rough bark; the peach grub goes to the root and not to the rough bark, and the apple borer more frequently damages the small smooth trees. A few of the codling worms crawl under the rough bark, but destroying only these would make but a small impression on the whole numbers. Good judges think that scraping the bark renders it more susceptible to the cold of winter, and coating the bark with a shell of lime is of little use. It is much better to promote growth by good cultivation or by a top-dressing of manure, and to kill insects on the branches by direct attack whenever they may be found. If lime is applied to bark it should be in the form of a thin wash which will scarcely change the color. Trees thus treated usually grow better than others, because those who take this care usually give good attention generally."

POISON SPRAY FOR ORCHARD TREES.

Mr. T. G. Yeomans speaks from much experience, in the *Country Gentleman*, of London purple for orchard enemies as better than Paris green, because it is cheaper, mixes well with water, and does not need to be stirred to prevent precipitation. A pound to one hundred gallons is a suitable proportion, the poison being first made paste-like in a small dish and then added to the tank. He applies it with a force pump, suction pipe, hose, etc., costing all complete, \$10, one man driving the team and directing the nozzle, while another works the pump vigorously. Thus hundreds of trees may be sprayed in a day. He thinks the best time is about when the blossoms fall, or as soon thereafter as may be convenient, and the effect is very soon noticeable in improved quality of fruit, due to the destruction "not only of cankerworms and codling moths," but of all other insects injurious to the apple. The *New York Tribune*, from which we copy this, says that those who may try this heroic treatment were lately cautioned by Mr. Baker against the danger of turning animals upon the grass until after it had been thoroughly washed by heavy rains.

THE INCREASING DESTRUCTIVENESS OF INSECTS.

Not long ago, a horticultural writer of considerable prominence, urged in one of our leading agricultural journals that all wild trees and shrubs be carefully excluded from the vicinity of our orchards. It was argued that the presence of such vegetation would attract these insect enemies, and so bring added danger from their ravages, but this seems a wrong conclusion. Facts show conclusively that the removing, not the planting of these wild and uncultivated plants, is what has augmented the evil in our midst. With plenty of wild cherry trees about the orchard, the trees in the orchard will suffer almost none from the tent caterpillar. And how much easier to destroy these caterpillars in a few wild cherry trees than when they are scattered wide through a whole orchard. I have reason to believe that the same is true of the apple tree borers and the apple maggot. If we have the wild haw and the wild crab in goodly numbers near by, the apple trees and their fruit will suffer less; often none at all. I believe then that reasoning from the insect side of the question, we may better plant, than to uproot or cut down these wild plants or trees.

THE RUSSIAN APRICOT.

The fruit of the Russian Apricot is quite similar to Early Golden in shape, size, and color; but, as the trees are seedlings, it varies very much in size, color, and quality. They are productive and valuable for sections where the peach is hardy, but not suitable for other localities. They winter kill at Bloomington, Illinois, in Northern Iowa, and also in Nebraska. They do well in the peach regions, and even north of them in Michigan, also in Western New York and Massachusetts, and all regions south of those States.

The Mennonites brought this fruit from Odessa and Bessarabia. The climate there is very near like this (Central Kansas), and by no means the cold 49th degree N. latitude, as often represented.—A. H. GRIESA.

[The great drawback to Apricot-growing is the early blooming character of this fruit. It is most always nipped in the bud by a late spring frost. In tree, the Russian Apricot is entirely hardy; whether its bloom is later, and therefore comparatively safer, remains yet to be seen. P. M. Augur expresses his views in the Manchester Mirror, as follows: "The term 'Russian Apricot' is very vague and indefinite, as much so as a 'Massachusetts apple'; it may mean a good thing or a very poor thing. Those of us who were induced to invest somewhat in the Russian Mulberry, so-called, are fully aware that not everything bearing the name Russian, is desirable. Now out of a great deal of chaff it is reasonable to expect some grains of wheat. Some of the very best seedlings of the Russian Apricot are being tested, and will in due time appear under their own individual names, properly indorsed as varieties worthy of trial merely. Our own impressions are, after hearing Professor Budd converse on these matters, both at the New Orleans Exposition and at the American Pomological Convention at Grand Rapids, that we run much less risk at present in experimenting with the Prunus Simoni, or Apricot Plum, than with the Russian Apricot in its first crude appearance; but we would by no means discourage those who have ample grounds and purses from experimenting with both; only we say, don't expect too much or you may be disappointed."]

POTTING PLANTS.

In setting plants in the ground in pots, be sure to stop up the hole in the bottom of the pot to prevent worms from entering. If you have coal ashes at hand, put a handful of them under each pot, and no worms will trouble them. Plants in pots, in the ground, must not be allowed to suffer from drying out. They need to be watered occasionally.

SUNFLOWERS FOR FUEL.

I grow one acre of them every year, and have plenty of fuel for the stove the whole year round, and use some in the other stove besides. I plant them in hills the same as corn (only three seeds to the hill), and cultivate the same as corn. I cut them when the leader or top flower is ripe, letting them lay on the ground two or three days. In that time, I cut off all the seed heads, which are put into an open shed, with a door in it, the same as a corn crib. The stalks are then hauled home and packed in a common shed, with a good roof on it. When cut in the right time the stalks, when dry, are hard as oak, and make a good hot fire, while the seed heads, with the seed in, make a better fire than the best hard coal. The seed, being very rich in oil, will burn better and longer, bushel for bushel, than hard coal. The sun flower is very hard on land. "The piece of ground selected to plant on should be highly enriched with manure. In the great steppes (prairie) region in the interior of Russia and in Tartary, where the winters are more severe than here in Dakota, the sunflowers are and have been for centuries past, the only kind of fuel used."—*Cheyenne Sun, Cor.*

TO KILL WORMS IN POTS.

Two or three years ago I read a communication in Vick's Magazine, from a lady who stuck matches in the soil about her plants, to kill or drive away the small white worms she found there. I tried it on a few plants, feeling almost afraid that the phosphorus would injure them, but I found that it did not, and I also found that the worms soon disappeared. I generally, however, use lime-water for driving these pests out of the soil. Slake a piece as large as a teacup in a pailful of rain-water. Pour off this water, after the lime sinks to the bottom, and use it as you would ordinary water about your plants. The worms will leave, and the plants will be greatly benefited by the application. I ought, however, to caution you against using it on azaleas, as these plants do not like to have anything to do with lime in any shape.

TO GROW PLANTS WELL.

Never let the soil in flower pots get dry enough to injure the tender roots at the sides of the pot. To prevent this, apply water enough to thoroughly saturate the entire ball of soil. Give so much that some will run out at the hole in the bottom of the pot. If you water in this way, and do not give another application until the soil on the surface looks dry, your plants will never suffer from drouth or from over-watering. A most pernicious practice is that of giving water on the little-and-often plan. Don't follow it.

CRESCENT AND CORNELIA STRAWBERRIES.

Crescent.—The berry for the multitude; no one can do without it who pretends to grow berries for profit.

Cornelia.—The world knows Matthew Crawford's reputation as a producer of new and valuable strawberries; but in this, I think he has surpassed all his former achievements. Of the largest size, handsome in color, good form, firm, quality excellent; plant healthy, vigorous, and very productive. Add to this its lateness, makes it most valuable. A correspondent wrote to me a year ago that it was but little later than Glendale, but with us this season, we had been over the Glendales three times when the first picking of Cornelia was made. And then such berries; the first central berry of each truss made as fine an appearance in the box as I ever saw. I expect to have of this berry when the others are all gone.—*Samuel Miller, of Missouri.*

HARDINESS AND PRODUCTIVENESS OF RASPBERRIES.

I have for several years been testing as to the hardiness and productiveness of raspberries. I would place them in the following order: Tyler, Doolittle, Ohio, and Gregg. The Tyler is very hardy and productive. The Ohio follows in good time, somewhat later, and it is a large yielder. The Gregg, the latest of all, and liable to be winter-killed, is only profitable on good upland and in protected situations. Of the red, the Philadelphia and Turner are perfectly hardy and yield a crop every year. The Cuthbert froze back to within two feet of the ground. It is a fine berry, but not as hardy as I would like. The Marlboro wintered better. Shaeffer's for six years has proved very hardy and productive. I have not lost a bush from any cause. Insects and blight, that affect black raspberries, do not trouble it. This is enough like a black-cap to be classed as such and to take their place, as it is gradually doing with those who know its worth. Were I to confine myself to one berry it would be this. There are no suckers, which with many varieties of the reds, are as troublesome as weeds.—*Rural New Yorker.*

SOME NEW ROSES.

Much interest has been manifested, particularly among professional florists, the past winter and spring, in the appearance of two varieties of roses thought to be especially desirable for forcing for cut blooms. These are Her Majesty and American Beauty. Her Majesty is a seedling produced by Mr. Henry Bennett, Stafford, England, and disseminated in this country by Charles F. Evans, of Philadelphia, who also brought to this country and sent out the bright crimson Hybrid Tea, William Francis Bennett, from the same English originator. Her Majesty appears to be satisfactory so far, to those who have tried it as a winter-blooming variety, and will probably prove valuable for that purpose, together with William Francis Bennett. What the character of these varieties will prove to be in open air culture in this climate is yet unknown. Her Majesty is described as a flower of immense size, in this respect rivaling Paul Neyron; color a delicate rose or satiny pink; very fragrant. The plant is said to be a strong grower, with beautiful foliage and quite hardy, but this last statement, in the absence of proof, has little or no value.

American Beauty, sent out for the first time this spring, is referred to by some as a Hybrid Perpetual, but its characteristics do not warrant this classification. The fact is, that its parentage is unknown. It is a chance seedling that

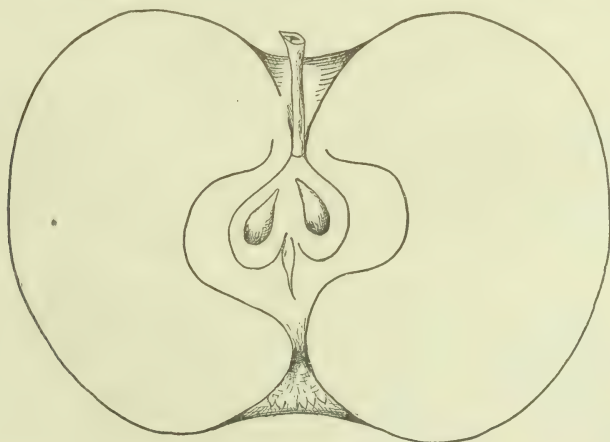
came up a few years since in the garden of Hon. George Bancroft, at Washington, D. C., and only within a short time has its valuable qualities become known. The flower is described as large and double, reddish crimson in color and with a rich fragrance. The plant is vigorous in growth and a free bloomer, and it is claimed that it survived exposure in the open field last winter, with the mercury at 20° below zero. It is, therefore, promising for open air culture. As a forcing variety it has already proved valuable.

CUTTING CAULIFLOWER.

Cauliflower is in proper condition for cutting at any time when the crowns (curds) are from the size of one's clenched fist, and thereafter until the heads are ready to shoot, or spread out, but before they lose their solidity. To preserve their whiteness, the outer leaves should be broken over the bud as soon as it begins to form, or else tie the leaves loosely over. To insure success the soil must be rich, well cultivated, and if dry weather ensues the plants should have an occasional soaking, until the heads begin to form fairly. Slight waterings will do little good.

"OHIO" AND "KENTUCKY" APPLES.

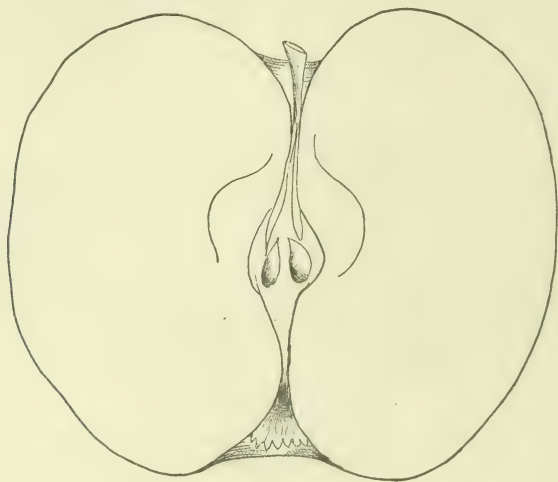
These two apples were exhibited at the annual meeting of the State Horticultural Society, by Mr. S. D. Bear, of Dayton, who received them from Mr. Thos. Biggar, of Manchester, Adams county, Ohio. They do not appear to have been described by Downing. Dr. Warder names, without special description, "Ohio Winter," and "Kentucky," and may possibly refer to these varieties. They are both good apples; and the Ohio, if the growth and productiveness of the tree is satisfactory, will be useful, as a good, long-keeping variety. The following descriptions give a fair idea of the apples, as exhibited:



No. 1, OHIO.

OHIO.—Skin, rather dull red, on a greenish ground obscurely striped and slightly marbled with brighter shades of red, covered nearly all over with

prominent, rather large, whitish dots, with dark points in the center; basin rather shallow, smooth; eye open; cavity deep, slightly russeted; stem straight, grained; flavor sub-acid, good. Season, December to January, and later. medium in size and length; flesh rather firm and white; texture medium fine. Apparently a good long-keeper.



No. 2, KENTUCKY.

KENTUCKY.—Skin, yellowish green ground, striped pretty thickly and irregularly, with dark and lighter shades of scarlet and crimson over nearly the entire surface, sprinkled with few light-colored dots; basin, shallow; eye, large, open; cavity medium, slightly russeted; stem, broken; texture, fine-grained, white; flavor, mild sub-acid, quite good. Season, late fall, or early winter.

REPORT UPON THE TWENTIETH SESSION OF THE AMERICAN POMOLOGICAL SOCIETY.

The American Pomological Society held its twentieth bi-ennial session at Grand Rapids, Michigan, beginning on the 9th of September, 1885, and continuing on the 10th and 11th inclusive.

At the opening session, the Secretary announced that the honored and venerable President of the Society, the Hon. Marshall P. Wilder, would not be present, but read the following communication from him :

"Gentlemen of the American Pomological Society: I still live, and would most gladly be with you on this occasion, but as 'discretion is the better part of valor,' I am compelled by the advice of friends of our cause, not to take the risk of so long a journey and the consequent fatigue of our session, but to reserve my health and strength, in the hope that you will come to me at Boston in 1887, when we may consult personally again, on the great interests which our society has in charge. I herewith transmit my address, in which I have endeavored to show the immense work it has already accomplished, and its future duty in directing and governing the pomology of this western world."

In the absence also of the first Vice-President, Hon. P. J. Berckmans, of Georgia, Patrick Barry, of Rochester, N. Y., was chosen chairman.

Mr. Barry called the convention to order, and after a few words of kindly

greeting, and the expression of regret at the absence of the President, called upon the Rev. Chas. Fluhner, who invoked the divine blessing upon the work of the Society.

President T. T. Lyon, of the Michigan Horticultural Society, in a few well-chosen words, warmly welcomed those present in behalf of the State Society. He accorded to the American Pomological Society, the honor of placing American Pomology in its present advanced condition, and as "having evolved order out of confusion, system out of chaos." He closed with these words:

"The Society has certainly a great work yet to do, not for Michigan only, but for the entire continent; since its organization is not local, nor yet national; but as broad as its title imports.

"We can scarcely over-estimate the importance of pomology—fruit culture—as a civilizing, educating, elevating, and refining influence; and the consequent importance of our mission; hence we hope to profit greatly, in these respects, from your assemblage among us."

Mayor Curtiss, of Grand Rapids, welcomed the Society in behalf of the city, and President Jas. B. Angell, of the Michigan State University, delivered an address of welcome on behalf of the State. To these addresses, President Barry made a most happy and appropriate response.

Boston, Mass., was chosen as the place for holding the next bi-ennial session, in 1887, by unanimous vote of the Society.

The Committee on Nominations reported the following names for officers for the ensuing two years, which were duly elected:

For *President*—MARSHALL P. WILDER, of Massachusetts.

For *First Vice-President*—P. BARRY, of New York.

For *Treasurer*—BENJAMIN G. SMITH, of Massachusetts.

For *Secretary*—CHAS. W. GARFIELD of Michigan.

President Marshall P. Wilder's Address then followed, full of interest and of wise suggestions for the future conduct of the Society. We have space only for a few extracts, which follow:

Gentlemen of the American Pomological Society:

With the close of this meeting of our association, thirty-seven years will have elapsed since its organization. Thanks to the goodness of an overruling Providence, it still lives to dispense its blessings on mankind. Long may it go on prospering and to prosper, while the earth bears a fruit, or man lives to cultivate it.

Happy should I be if I could meet with you, to express personally our gratitude to the Michigan Horticultural Society for its cordial reception, and the ample accommodations it has provided for us; and most happy should I be to exchange congratulations on the continuance of our lives; to rejoice with you in the prosperity of our Association, and to concert measures for its usefulness in advancing the great work that has been committed to our charge; but as this cannot be, I console myself with the hope that you will accept the invitation of the Massachusetts Horticultural Society, and come to Boston in 1887, when I may be permitted to lay off the robes of office with which you have so long honored me, unless, ere that time, I shall have been clothed with the robes of immortality, and gone up to gather celestial fruits, which ripen not in earthly climes.

The work which our Society assumed, was great indeed—no less than to compare fruits, and opinions as to the value of the numerous varieties in cultivation; to assist in determining the synonyms by which they were known; to endeavor to abridge by general consent, the long catalogue of indifferent or worthless sorts then propagated by nurserymen and cultivators; to furnish reliable information in regard to the varieties which succeed in our varied climates; to maintain a spirit of cordial intercourse with kindred institutions—in short, to extend and improve the culture of fruit throughout our land. Thus our Society became the herald and guardian of a new era in the progress of pomology never before known in this or other lands. It was its mission to lead in this most beneficent work. Most faithfully has it executed this trust, embracing, as it now does in its organization, not only the States and Territories of our Union, but the British provinces on the north, all of which are represented in our

institution, thus constituting, as it were, a Continental Association, working together harmoniously for the advancement of the pomology of the American continent.

* * * * *

In reviewing events since our last meeting, I feel that we should most gratefully recognize that divine goodness which has preserved the lives of so many of our members to the present time. Some few—only a few—from our large membership have passed away, and only one, so far as we know, of the more than one hundred connected with us by official relations, has departed since our last session, two years ago.

But he whom we could least spare has been taken from us. Charles Downing, our beloved friend, the upright man, and the great pomologist of America, is no more! The loss to our country and cause seems now to be irreparable. But Infinite Wisdom cannot err, and we should be thankful that he has been so long spared to us.

Mr. Downing was born at Newburg, N.Y., July 9, 1802, and died at his home in that city, January 18, 1885. His death is to me a most afflictive event. We were associated together for nearly half a century, in efforts to advance the pomology of our country. Succeeding, as he did, his brother, A. J. Downing, whose eulogy it was my sad duty to pronounce, thirty two years ago, he became the editor of the *Fruits and Fruit Trees of America*, all the editions of which have been dedicated to my name from the first. These circumstances have drawn us more and more closely together by the ties of affection and friendly regard.

As a pomologist, he was world-renowned for his knowledge, accuracy, and good judgment, and as such had a longer experience than any other man of whom I have any record, in this or any other country. His books will ever be precious memorials of good fruits and good men; of a life whose object was to make others happy in the enjoyment of the beauties and bounties of creation, and which has been a blessing to our world.

WHAT OUR SOCIETY HAS ACCOMPLISHED.

When we reflect on the unsettled and chaotic condition of pomology in our country when our Society was established, the narrow limits to which fruit-culture was confined, and the few engaged in it, and compare it with the immense territory now occupied for this purpose, and its importance as a great industry of our country, I think it may be well to take a retrospective view and see what our Society has accomplished.

It has raised the standard of excellence by which our fruits are judged, discouraged the cultivation of inferior sorts, and thus educated the taste of the public for those of better quality, so that kinds once common in our markets have become obsolete, and are now considered unworthy of propagation. In doing this portion of its work, it has discarded, by general consent, more than six hundred varieties, either worthless or superseded by better sorts.

It has established a uniform system of rules, by which fruits are to be shown and judged. But, what is of the highest importance, it has instituted a much needed reform in the nomenclature of fruits, by which all long, unpronounceable, indelicate, inappropriate and superfluous words are to be suppressed in the dedication of our fruits.

One of the grandest achievements of the Society is its Catalogue of Fruits, published biennially, with isothermal divisions and columns for fifty States, Territories, and districts, in which are recorded the fruits which may successfully be grown in those divisions, with stars to designate the merits and seasons of each. This is a work of great merit, and not attempted by any other society. And here let me say, that we should never forget how large a debt of gratitude we owe to Mr. P. Barry, as chairman of the General Fruit Committee, for its compilation and classification. He has performed this duty for a long course of years; and fortunate indeed is it that we have, as his successor, his son, Mr. W. C. Barry, who has been so well educated for this duty.

To record all the good the American Pomological Society has accomplished, would be equivalent to writing the history of American Pomology, during the period of the Society's existence. Its proceedings are not only a record of the events of the time, but they clearly show that the Society has been pre-eminently instrumental in shaping and directing the pomological destinies of our continent. It has organized and systematized everything pertaining to fruit-culture, and has developed and elevated American Pomology. The fruit catalogue is a grand and glorious work, but far greater is the educational and refining influence which the Society exerts over its members. No one—unless he be irredeemably depraved—could attend its meetings without becoming, not only a better pomologist, but also a better man and Christian.

The work which our Society assumed, was immense. It required a great society

to carry it on. A great amount of time, labor, and treasure has been expended in bringing it to its present flourishing condition; but, however great the labor performed, and the sacrifices made in behalf of our Society, no one regrets them, but all rejoice that they have had a share in promoting a work so beneficent in its design, and in perpetuating it for the comfort and happiness of mankind.

That the Society's mission for the future will be not less beneficial, is hardly to be doubted, built upon so solid a foundation as it is. It will continue and complete the reform in nomenclature just commenced. As the laws that govern cross-fertilization become better and better understood, it is not improbable that the most desirable types and strains of fruits will become more firmly established, resulting in the diminution of the number of varieties, and the perpetuation of only those, best adapted to our various climates and soils. The special aim of the Society should be to enlist in its active membership, all the best elements of our country, and to form, as far as possible, a closer relation with all existing State Pomological or Fruit Growers' Societies.

Nothing has afforded me more gratification than the favor with which our rules of pomology and the reform in the nomenclature of our fruits have been received.

I desire especially to enforce upon nurserymen the duty of aiding in this reform, by revising their catalogues so as to correspond with the improved nomenclature. Horticultural and pomological associations have thus far been our most powerful auxiliaries in this good work, but they do not come in contact with the people at so many points as the nurserymen, whose catalogues are distributed broadcast over the land, and I would especially appeal to the many honorable representatives of this profession here assembled, to give us their hearty co-operation until the work is accomplished.

PRODUCTION OF NEW FRUITS.

And now, in fulfillment of my promise to urge upon you while I live, the importance of producing from seed, new, improved varieties of fruits, adapted to the various soils and climates of our vast territory, I have substantially to repeat what I have said in my former addresses. These are the means, the only means, which God and Nature have provided for the improvement of our fruits, and the better we understand and practice them, the nearer shall we approach to that divine Beneficence, which gives flavor and richness to our fruits, and to the senses, the highest types of beauty, grace, and gratification.

When we consider that the art of crossing varieties for their improvement was scarcely known until our day, and see what wonders have been accomplished by it, who can doubt that we may yet produce a pear with the richness of the Seckel, the form and size of the Bosc, and the vigor and productiveness of the Boussock. And so we may go on to improve other fruits, until all shall be made as perfect as ever were grown by "the grand old gardener" in Eden. But to do this, we must study the characteristics of varieties, and thus help Nature to perfect this work.

Thus Providence has placed in the hands of man a power to assist nature in the production of her most perfect and beautiful creations. And whatever some may think of variation, evolution, transmutation, or transformation of species, the great fundamental law of life and its reproduction will remain unchangeable and immutable as long as the earth bears a plant, or a tree yields a fruit, or Nature holds her place in the Universe.

We have now many excellent varieties of fruits from foreign lands which are suited to many of the soils and climate of our country. But when we reflect upon the number that have proved worthless, and are not suited to our condition, and consider the large number of American sorts that have already been raised, we are forced to the conclusion that we must, hereafter, rely mainly on the production of new varieties from seed to supply the necessary kinds for our constantly increasing territory for fruit-culture.

When we reflect on the improvement which has been realized by cross-fertilization in the various species of the vegetable kingdom, we can scarcely fix a limit to its potent influence for good on our fruits. And we may thus go on, from one degree of excellence to another, until we shall produce fruits as fine as were ever grown by our father in Eden. Go on prospering and to prosper in this most promising and beneficent work. You can do nothing better for the generations that are to follow us; and so again, with line upon line, and, perhaps for the last time, I leave with you my old injunction: "*Plant the most mature and perfect seeds of the most hardy, vigorous, and valuable varieties; and, as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence.*"

And now, gentlemen, in conclusion, let me again congratulate you on what our Society has already accomplished. "The past is secure;" but the great duty still remains of extending, fostering, and rightly directing the Pomology of our country.

Other societies have arisen, and will continue to rise, and help forward our noble designs; but the American Pomological Society will still bring together the most distinguished cultivators of our land, and will be the great head, guardian, and guide of the Pomology of this western world.

DISCUSSION ON NEW FRUITS.

APPLES.

Yellow Transparent.—Peter M. Gideon: It is of Russian origin, and not quite hardy in Minnesota. About the same in hardness as the Oldenburg, which has always proved hardy, until the past winter.

Reported from New York, fair in appearance and better than Early Harvest; also generally regarded as earlier, and of much promise as an early market apple.

Very promising in Canada, and ten days earlier than any other variety.

Prof. J. L. Budd, of Iowa, says it is nearly two weeks earlier than Red Astrachan, and as hardy as Oldenburg, but not as uniform in size.

This apple was introduced into England from Russia in 1827, and was there named Sugar-loaf Pippin.

The Dickenson.—W. H. Moon, Pennsylvania: This apple was illustrated in the last Pennsylvania Horticultural Report. It is a fine, red apple, of good size.

Howard A. Chase, Pennsylvania, says the Dickenson is a seedling of yellow Bellefleur, raised by Mr. Dickenson, of West Chester, Pennsylvania; ripens about with the Bellefleur; color, a yellowish green covered with stripes and splashes of red; quality, about like Bellefleur. It is a reasonably good grower, habit somewhat like the Bellefleur, and should go on the list.

Chas. A. Green, New York, called up an apple sent from Arkansas, and known as the *Shannon*.

J. C. Ratliff, Ind.: It is the best winter apple for Arkansas, and is supposed to have originated in that State.

S. Hape, Ga.: At the New Orleans exposition last winter, it was exceedingly fine in appearance, and of very good quality. I believe that the State of Arkansas took the premium on apples mainly because of its beautiful exhibit of this variety. I am told that it is a shy bearer, and only adapted to the mountain regions of Arkansas.

T. T. Lyon, Michigan: It is a very fine looking apple, of not very good quality. I think it would be very good to sell. It is somewhat the color of Peck's Pleasant; a little more oblong than that apple, and seldom, if ever, has a red cheek. As to quality, all the apples at the south are so mild compared with the same varieties at the north, that the latitude may have affected the quality as we saw it there. It seemed to take a high position with fruit men at the exposition, but was spoken of rather as a market fruit than for its quality.

Celleni.—Charles Gibb, Quebec: It is a Scotch apple. Near Montreal, it is very good, not as heavy a bearer, nor as early as Yellow Transparent; still a good bearer, hardy, of good size and fair quality.

J. L. Budd, Iowa: My opinion is that it is a Polish apple, as we have imported it from Poland. I think it fully as hardy as Fameuse. It is large, rather showy,

and ripens in late fall or early winter. It is not an Iron-clad, unless Fameuse may be so-called.

Charlotten Thayer.—J. L. Budd: This is of the Yellow Transparent class, a little later, and probably a little larger, and many of our people think a little better grower in the nursery.

Charles Gibb: It is eatable with us about July 25. This year it was about three days later. An early market variety which can hardly be distinguished from the Yellow Transparent.

Prof. Budd: It is a few days later than the Yellow Transparent.

T. T. Lyon: At New Orleans last winter there was shown, from Wisconsin, a large and very beautiful seedling of the Alexander, called *Wolf River*.

J. L. Budd: It has most of the habits of the Alexander. In our western climate, it is inclined to blight, like all of the Aport type. It is not as hardy as the Oldenburg, and has most of the faults of the Aport family. I do not know of an Aport that is exempt from blight to quite an injurious extent.

P. M. Gideon, Minnesota: Somewhat tender in our State.

P. M. Augur, Connecticut: At New Orleans, one of the most beautiful apples on exhibition.

Prof. Budd: It is at least 30 per cent. hardier than Fameuse.

Gideon.—P. M. Gideon, Minn.: This is from the seed of a seedling crab about the size of the Transcendent, which stood in an orchard surrounded by Blue Pearmain in blossom at the same time. The tree resembles the Blue Pearmain. We grew 500 seedlings, but only about 20 proved hardy, and none of them were of any value except those from trees near the Blue Pearmain. All were from crab seed, or supposed to be crossed with crab.

Excelsior.—P. M. Gideon, Minn.: This is from the seed of the Wealthy, and may contain a cross of the Cherry Crab or the Oldenburg. It is a little larger than the Wealthy, of equal quality, is more hardy and a good bearer. We consider it safe to plant as far north as anything we grow.

Peter Caller, of Michigan, asked about the

Salome.—J. L. Budd: It is being tested in Iowa, and thought valuable. It originated on the Illinois river with Mr. Hathaway. It is a good keeper and grower; more hardy than Ben Davis. Its season in central Iowa is January to March. It is of better quality than Ben Davis, but not larger than a well grown Winesap.

Hog Island Sweet.—J. J. Robinson, Mich.: It ripens in October; and is a good bearer, a little above medium size when not overbearing, and is one of the best for the dessert. It will keep till Christmas. It is quite red on the sunny side, and yellowish on the other. It bears every year.

B. Hathaway, Mich.: It is not hardy with me, but of excellent quality and one of the best of sweet apples for its season.

McMahon's White.—A. E. Gipson, Colorado: This apple has recently taken a prominent place in Wisconsin. It is spoken of as exceedingly hardy and has recently been added to the preferred list for that State.

J. L. Budd, Iowa: During July of this year I spent two weeks in Wisconsin visiting the apple orchards. The McMahon's White is of the Aport class, and I think is not as hardy as Wolf River. We can not call all apples of that class hardy, but have to class them with the Fameuse in hardness. It is not as large as Wolf River, and more like the Northern Spy in shape. It is of the Alexander class, but not of the same color.

R. Morrill, Michigan, called attention to an apple in his orchard like the Northern Spy in all respects except in being sweet. It was supposed to be a Spy until a year or two ago. Similar cases were mentioned by others; were considered seedlings.

Northwestern Greening.—T. T. Lyon, Mich. : As exhibited at New Orleans, it was very attractive in appearance, but not very good quality—about as good as the Pennock. It is hardy.

J. L. Budd, Iowa : I was very favorably impressed with its appearance at New Orleans. During the last month I called to see the original trees, planted twelve years ago, within eighteen miles of Lake Michigan, west of Milwaukee. They were planted in an orchard with Fameuse, Talman Sweet, Pewaukee, and others. The damage from the winter was not as severe there as further west, and all of these varieties were in good condition, except the Northwestern Greening; out of eight trees of this variety only one was in good condition; hence it cannot be very hardy. It is conical in shape and should not be called a Greening. It has a deep basin, like Grimes' Golden, and resembles that apple.

Kellogg Russet.—Charles Gibb, Quebec : It is grown by A. G. Tuttle, of Wisconsin. It is just like the Golden Russet of western New York, but a more thrifty tree, and more hardy.

Mann.—E. Moody, Lockport, N.Y. : We value it highly. It is always of fine shape, good size, and as far as I have known, hardy. Planted thirty or more years ago at Niles, Michigan, with other varieties, it is still in fine condition, while the others are gone. Downing says it originated in Otsego county, N.Y. I have perhaps 1,000 trees in orchard of this apple, just coming into bearing. It is a fine grower. It is somewhat conical, green in color, with a light flesh, always fair, of good quality, and keeps exceedingly well. It sells well in Europe. Mr. Parmelee, of Old Mission, Michigan, sent them to Scotland, a few years ago, and received a net price of six dollars a barrel. I have known them to sell in New York City at five dollars a barrel, when other varieties in good condition brought but three dollars.

C. T. Rosenkrans, Mich. : I have a few trees, and they are more hardy than Baldwins.

C. L. Hoag, N.Y. : I have grown the Mann apple for twenty-five or thirty years. The tree is very spreading when in bearing. The apple is covered with white specks, and has a blue shade on the sunny side. The tree is liable to overbear, and the apples be small. If the fruit is thinned, it will be about the size of the Rhode Island. I keep it until June. Quality fair, better than Roxbury Russet. I never saw the codling moth work on it.

Mr. Moody : Until it comes into bearing, it is one of the most upright growers. The Mann apple of Massachusetts has a tough skin.

P. M. Augur, Conn. : How is it as a cooking apple in the spring?

Mr. Moody : It is the best we have at that season of the year, but not quite so tart as some earlier kinds.

Prof. Budd : Our nurseries introduced it extensively, and it grew well until the last three winters; but I do not know of a live tree in a nursery west of Lake Michigan, as far south as Waukegan, Ill. It has not stood as well as Ben Davis. I would like to ask Mr. Moody the difference between the Mann and the Virginia Green.

Mr. Moody : They are distinct. The Mann is a seedling which originated in Otsego county, N.Y. I gave it the name Mann, as it grew in an orchard among other seedlings of Mr. Mann. It differs from the Virginia Green in flavor and growth of tree.

Benjamin Hathaway, Mich. : I had last fall two year old grafts of the Mann and the Red Canada in the tops of large trees; the Mann all stood, and the Red Canada killed half way back.

T. T. Lyon, Mich. : I think it sufficiently hardy for Michigan, but not good to eat or cook, though it sells well.

Mr. Hathaway: I think the Mann is worthy of some commendation. The Red Canada is failing in Southern Michigan, and we have to look out for something that will do better. For market purposes we must grow apples that we can grow in quantity, and that will sell.

J. S. Woodward, N. Y.: When the Mann is fit to eat, the others are gone. It will keep longer than the Roxbury Russet.

P. M. Augur, Ct.: We have an apple in Connecticut much like the Mann, called the

Coe's Greening.—It is an abundant bearer, smooth and handsome, of medium size, not of first quality, but a good cooking apple; keeps till May or June.

Somerset.—C. L. Hoag, N. Y.: As growing in Niagara county, it is a deep golden yellow, of the shape and size of the Black Gilliflower, and an enormous bearer on alternate years. A fine dessert apple.

Lou.—Mr. Gipson, Col.: As I have it on my grounds it seems promising.

Mr. Gideon: It originated with me, and is a seedling of the Oldenburg. It is ten days earlier than that apple, and earlier than the Tetofsky. Quality first-class, both for dessert and cooking.

Jacob's Sweet.—J. W. Manning, Mass.: It resembles the Sweet Bough, but has more blush on the side, and will keep till July 4. It is described in the last Massachusetts Horticultural Report. It is not yet disseminated.

Mr. Coleman, Commissioner of Agriculture, called attention to

Wright's Geneting.—It is an apple so named by Dr. Warder, from specimens sent him by Mr. Coleman, two or three years ago. "They somewhat resemble Rawle's Genet, but differ in quality, and especially in the growth of the tree; it being larger, and the apples not being in clusters like Rawle's Genet. I saw the original tree in the orchard of Mr. Wright, and he told me it was the most profitable tree in his orchard. It is an annual bearer, as the Rawle's Genet is not, but probably will not succeed in Michigan."

Mr. Lyon: Rawle's Genet succeeds here. I would like to ask Mr. Coleman about the

Missouri Pippin.—Mr. Coleman: It originated in Fayette county, Ohio. It is an early bearer and very productive, and in its locality is being extensively grown.

Mr. Barry: The Missouri Pippin is starred for Kansas.

P. M. Augur: It was one of the most beautiful apples on exhibition at New Orleans.

J. L. Budd: There is a variety of the Russian apple that has been widely fruited that has many desirable qualities for parts of the country where we need something hardy, called the

Longfield.—Notwithstanding the past three cold winters in succession, it has each year been loaded with fruit, besides making a growth of 16 to 18 inches. It is larger than Jonathan, about the weight of an ordinary Missouri Geneting, but not the same shape. It is yellow, with a flush like the Maiden's Blush in the sun. Keeps through the winter. Equally as good as Fameuse, and somewhat like it. It originated at Sarepta, on the Baltic, hence is not as hardy as some. It is adapted to about the 42d parallel, the Jonathan being adapted to about the 43d. It keeps better than Fameuse.

CRABS.

Whitney's No. 20.—Charles Gibb, Quebec: I fruited 27 varieties of crabs this season, and consider this the best. The texture of the flesh just as it becomes mellow, is the only thing indicating Siberian blood.

Early Strawberry.—Ripens with the Red Astrachan apple. It is of small size, but nothing that I grow equals it in quality. It has no astringency.

Gibb.—A seedling originated by Mr. Pepper, of Pewaukee, Wisconsin, and so named by him, and is noted in the special list of best crabs for that State in the last Wisconsin Horticultural report.

A discussion then followed on the uses of crabs for culinary purposes and for the purpose of originating hardy apples.

On Wednesday evening, September 9th, an interesting and valuable lecture was given, from which we make the following extracts:]

INJURIOUS FUNGI, IN THEIR RELATION TO THE DISEASES OF PLANTS.

By CHARLES E. BESSEY, OF THE UNIVERSITY OF NEBRASKA.

GENERAL NATURE OF A FUNGUS.

I proceed to the first topic of my address, viz., the general nature of the fungi. I call your attention to the fact that the plants included under the general name of fungi are exceedingly numerous, and they present greater differences in structure, reproduction, restriction, and habits of life than are to be found in all the plants that the farmer, or the gardener, or the pomologist has brought under cultivation. Nay, more, if we compare the greatest *Sequoia* or *Eucalyptus* with the tiniest moss which grows upon its bark, the difference in size alone is far less than between the largest and smallest of the fungi, while in modes of nutrition and reproduction, the differences are still greater. In fact, the fungi do not constitute a single group of plants with similar structure and other characters. There are, on the contrary, many groups of plants with varying degrees of difference and resemblance.

We are thus obliged to make some sort of classification of this great group, for convenience, if for no other reason. One of the most convenient of the physiological classifications (and perhaps one of the most profitable, too) is that which sets them off into two or three groups, viz., the (1) saprophytes, (2) the parasites, and (3) the parasite-saprophytes.

THE SAPROPHYTIC FUNGI.

By the saprophytes we understand all those fungi which live upon dead or decaying matter. Such are many of the moulds, familiarly represented by the pastry mould (*penicillium*) which so often occurs upon pies, bread, etc. The toadstools which spring up from the heap of rotting vegetable matter in the barn-yard are saprophytes of a high order, and so too are the great puff-balls so common in meadows and woodlands. Saprophytes abound in and upon all decaying timber. Every log in the woods furnishes in its decaying substance the food upon which many species are nourished. In every case the saprophyte obtains its food from dead matter, and not from that which is living; consequently, the grower of trees need have no fears of injury from fungi of this kind.

THE PARASITIC FUNGI.

Those fungi which obtain their food from the living tissues of plants or animals are termed parasites. They penetrate the bodies of their hosts and absorb the nutritious matter of the cells for their own use. In some cases the result is simply a lowering of the vitality of the part affected, while in others the injury is so great that the cells die and the tissue falls into decay. The particular difference, then, between a saprophyte and a parasite is that while the former attacks and feeds upon dead animal or vegetable matter, the latter confines itself to living tissues. The parasite dies if its host dies. It must have living tissues for its nourishment, but the saprophyte feeds only upon the dead tissues, not being able to attack living cells. The domain of the parasite ceases where that of the saprophyte begins; hence, it often happens that the latter completes the work of destruction begun by the former.

THE PARASITIC-SAPROPHYTIC FUNGI.

Lying between the classes of fungi just described, is another vaguely defined class, connecting the other two. These are the parasite-saprophytes; that is, the fungi which, while essentially saprophytic in habit, are given to more or less of parasitism also. They attack languishing tissues, and hastening their death, then feed upon the decaying mass, and in many cases they even begin their work upon apparently healthy cells. There are all gradations in the fungi of this intermediate class con-

necting the genuine parasite with the purely saprophytic species, and these are the fungi which are probably the most to be dreaded. A true parasite, requiring living tissues for its support, must necessarily work slowly enough, so that the leaf, stem, or fruit affected shall continue to have living cells throughout the period required for the full maturity of the fungus. There is thus a natural check placed upon the parasites which prevents their becoming as destructive as those which, while parasitic, are at the same time saprophytic.

Now, it must be borne in mind that the three classes of fungi mentioned are established upon their habits alone. This is not a scientific classification, but a convenient physiological one, which enables us to group together those having similar habits, without regard to their structural character. In the further discussion, the terms saprophyte, parasite, and parasite-saprophyte will be used descriptively, with the limitations and definitions given above.

THE PRINCIPAL FAMILIES OF THE HARMFUL FUNGI.

I come now now to the second part of this paper, and ask you to follow me with some care while I pass in rapid review before you the principal families of the injurious fungi. I here propose to direct your attention to those general features or the groups of harmful fungi, which will enable you to see why some are so much more injurious than others, how they are reproduced, and the manner of their development.

It should be said at the outset that these groups are made by considering structure alone; in other words, all modern classification is based upon the structure of the plant body and the different organs of which it is composed. The practical value of this principle of classification is readily seen when we realize that by it we bring together all those plants whose modes of reproduction are similar. A skillful botanist is thus enabled to predict with much certainty the life history of a fungus from an examination of but one of its stages. Nay more, from a single spore it is often possible not only to make out the family to which a plant belongs, but also to indicate with reasonable certainty the general structure and habits, as well as the general methods of reproduction. One is often thus enabled by a mere glance at a fungus to determine its harmlessness, instead of being obliged to enter into a long and tedious investigation.

I. THE BACTERIA.

This is the lowest family of fungi with which we have anything to do in this paper. There are other families whose members have a still simpler structure, as for example, the slime-moulds (*myxomycetes*), but they need not concern us at present, although it appears that some of them are harmful.

The bacteria have been described as the smallest of living things, many of them being no more than a 20,000th of an inch in diameter; others are still smaller, running down to a 40,000th and to a 50,000th of an inch. Such minuteness is absolutely beyond our conception. If we were to magnify one of the smallest of these so as to make it appear as large as a moderate-sized apple, an apple equally magnified, would be over two and one-third miles in diameter.

Now, these minute organisms are single-celled plants, or little chains of cells. They obtain their food by simple absorption from the medium surrounding them. Thus, if they grow in the blood of an animal they absorb the plasma of the blood, or possibly portions only of it, and in this way are enabled to increase in size and substance. By changing the proportions of the constituents of the blood, or of a plant cell, they produce a fermentation which completes the work of destruction.

The most common method of reproduction in bacteria is by the simple division of one cell into two. Imagine an orange gradually constricting itself in the middle, while the two halves keep swelling. This would represent the fission of a bacterium. Thus every cell may become two cells; each may again become two, and so on the reproduction goes, each step being a multiplication by two. You all know that the earlier steps of a geometrical progression are short and slow, but after a time the stride is by millions and billions. So it is with the development of bacteria. When an inoculation takes place, as in the experiments on apple and pear trees first performed by Professor Burrill, and afterwards by Mr. Arthur, there is always a period of incubation during which the bacteria are multiplying. The beginning of this period is one of apparently perfect health, but it finally merges with increasing rapidity into the state of active disease. We can now understand what the period of incubation is. It is the time required by the bacteria to carry their geometrical progression far enough to bring about much disturbance in the infested tissues.

There are other methods of reproduction, as by the production of still more minute spores, but we may for the present pass these by. I must not omit calling attention to the manner of distribution of the bacteria. When the juice of an infected apple tree exudes upon the side of a twig, the rains may wash out the gummy matter, leaving the bacteria exposed to the dry winds. By these they may be picked up and carried half way round the world.

Tyndall found, that while the lower strata of the air are laden with bacteria, the air of the upper regions, say at an altitude of several thousand feet, is free from them.

It is pretty likely that many bacteria are incapable of withstanding the prolonged drying of the air of the desert-like regions of the earth. It is well known that in some parts of the west, where the air is very dry, the exposed beef and venison remain perfectly sweet for days and even weeks. This would be impossible in an air swarming with bacteria.

The study of the bacteria has acquired a new interest to the pomologist within the past five years. The brilliant discovery of the agency of bacteria in the production of blight in apple and pear trees, made by Prof. Burrill in 1880, and since then fully confirmed by Mr. Arthur in an extensive series of experiments and observations by the New York Agricultural Experiment Station, has entirely changed the whole aspect of the long-continued discussion regarding the disease. A blighting tree is suffering from a disease analogous to the small-pox of the human subject, or the anthrax of our domestic animals.

II. THE MILDEWS. (PERONOSPOREÆ.)

I pass over a number of families of the fungi in order to take up the extremely parasitic plants which sometimes are called the Mildews. They are all plants of much higher organization than those we have been discussing; in fact, the distance from the bacteria to the mildews is vastly greater than from the lowest flowering plant to the highest.

The plant-body of a mildew consists of long, slender, tubular branching threads, which penetrate the tissues of the host, and ramifying there in every direction, gather food from the living cells. If we take a plant which is affected by one of the mildews, we find its tissues penetrated by slender branching threads. Many of the threads send out, here and there, short, root-like branches, which enter into the interior of the cells, and act as suckers for drawing out the nutritious matter they contain. This, of course, is quickly followed by the death of the cells so affected. These threads in the interior of the host, keep on growing until they have gained sufficient strength to begin the process of reproduction. This takes place as follows: The parasitic threads begin growing out towards the breathing pores of the epidermis, and, pushing through these, emerge into the air. Here they branch repeatedly (in most cases), and finally the ends of the ultimate branches swell up, and then become pinched off, as roundish spores. In this way, myriads of spores are produced, and as they are very small, and very easily detached, they are picked up by the lightest breeze and carried to greater or less distances. Every spore which falls upon "good ground," so to speak, springs up and brings forth, as did the seed in the Scriptural parable, "some thirty, some sixty, and some an hundred fold."

Every such spore requires a certain amount of moisture to enable it to germinate, so that should it fall upon a leaf which is not moist enough, it will not germinate. Moreover, should it germinate upon a leaf of a species unsuited to it, the growth will soon cease. Still more, if favorable conditions are not obtained soon, the spore dies, and germination is impossible.

The method of germination varies somewhat with the different species. In some cases the spore bursts and sets free its protoplasm which has broken up into little swimming bodies—zoospores. After a time these turn into minute spores, and they then germinate by the forming of a tubular prolongation. The latter soon bore through the epidermis into the tissues of their host. In other cases the spore in germination produces a tubular prolongation at once, not breaking up into zoospores, and this tube bores into the host directly. In either case, the spores so produced are for the quick reproduction of the fungus. And notice right here that this method of reproduction takes place while the general conditions are still favorable for the growth of the parasite. Notice, further, that these spores are produced by a kind of division of the plant, and that there is no kind of fertilization, that is, that this is a non-sexual reproduction. It may be compared to the reproduction of the bacteria, which as you remember, is entirely by division, and is likewise non-sexual.

However, later in the season, as well as later in the life of the parasite, when the general conditions are less favorable for growth, and when the general vitality of the parasite is beginning to wane, a true sexual reproduction takes place. Two cells grow out from a thread of the parasite; one of them becomes globular, the other cylindrical, and at a certain stage the cylindrical one bends over against the other and unites its protoplasm with it. The united protoplasm now forms a hard shell around itself, and it is then a spore. Now, this process is a simple kind of fertilization, in other words it is sexual reproduction, and is analogous to the sexual reproduction in the higher plants.

The spores so produced being larger, are not readily blown about by the winds; moreover, being in the interior of the tissues of the host, they could not be picked up by the winds, even were they minute enough. They remain in the tissues now rapidly falling into decay, and thus drop to the ground and remain there until the following spring, or at least until the return of favorable conditions. These spores, being thick-shelled, are capable of retaining vitality for long periods, hence they are called resting-spores. They germinate in much the same manner as the non-sexual spores first described, that is, by the bursting of the cell-wall (shell) and the formation of zoospores. Right here a practical suggestion may be made, and that is, that as the resting-spores pass the winter in the decaying masses of affected leaves and stems, the burning of the latter would be a most excellent practice.

THE BLIGHTS. (PERISPORIACEÆ.)

These plants resemble the mildews in general appearance, being composed of branching threads. However, while the threads are tubular in the mildews, they are divided by numerous cross-partitions into cylindrical cells. To the naked eye the two kinds of parasites appear much alike. There is, however, a marked difference between them when we consider their habits. While the mildews grow *through* the tissues of their hosts, the blights grow *upon* the surfaces of the leaves and stems, merely sending little suckers into the epidermis here and there. It will readily be seen that a parasite of this nature is not likely to become as harmful as those which grow through the tissues of their hosts, and in practice we find that such is the case. The blights, although numerous as to species, and affecting, as they do, a great many plants, do far less damage than the mildews. Still, when they grow in abundance upon their hosts, the injury they produce is by no means small, and the group is worthy of some attention at this time.

When a blight begins its growth upon a plant, it consists of a few colorless threads; these rapidly extend themselves, and by repeated branching soon cover the surface with a dense mat which shuts out the air and chokes up the breathing pores. About this time many of the threads send up vertical branches, the tops of which pinch off and form spores. Now these spores are very clearly the homologues of those formed upon the branches which protrude through the epidermis in case of the mildews, and like them they are formed when the vegetative activity of the parasite is greatest. These spores, falling off, are borne by the winds to other hosts, and there, if the conditions are favorable, they germinate. Each spore sends out a tubular prolongation, and this by continued growth becomes a new parasite.

Later in the season, when the vitality of the blight fungus is lowered somewhat, it ceases the production of spores of this kind (the non-sexual kind) and begins the development of organs of sexual reproduction. Two shortish cells develop much as in the mildews, and unite their contents. As a result of this union a rather complex globular fruit is produced. In this case the walls of the fruit are somewhat hardened so as to withstand accidents and harmful influences. Within it are contained from twenty to a hundred or more spores. This fruit represents the resting stage of the mildews, and is in fact, in these fungi, a resting stage, as by its thick walls it preserves the vitality of its spores until the following year.

Here the practical lesson to be learned from our knowledge of the plants of this family is that the time for attacking them is, as before, during their resting stage, while they are blowing about during the autumn and winter, upon the dry leaves which had been infested the season previous.

THE BLACK FUNGI. (PYRENOMYCETES.)

This enormous group is doubtless more harmful than all the other fungi put together. It is made up of a great number of species whose life-histories we know something about, and with whose principal modes of reproduction, we are fairly familiar. But in addition to these, there are grouped here a vast number of whose life-history we

know little. The latter are grouped with the black fungi because of certain general resemblances, but it must be borne in mind that until we know their whole life-history we cannot be positive as to their position here.

In general we may say that the black fungi are parasitic or saprophytic plants, with usually somewhat hardened tissues. In their earlier stages their thread-like growths extend themselves through the tissues of their hosts and feed actively upon them. They soon produce upon the surface of their host myriads of minute spores which are non-sexual in character, and which are evidently designed to quickly produce more black fungi. The disease, for such it may truly be called, is extremely infectious at this stage. The minute spores may be blown from plant to plant, or carried by birds and insects, or even rubbed off upon unaffected parts. They germinate freely, and soon produce more of the fungus, if the conditions are favorable.

Later in their history, these fungi produce the hardened, blackish or dark growths which give name to the group. In these hardened growths there are developed spores similar to the later spores of the blights. In both groups the spores are in sacs; hence, the blights and the black fungi, together with a number of other families, are gathered into the great class of the sac-fungi (*Ascomycetes*).

The black knot of the plum and cherry (*Plowrightia morbosa*) is a good illustration (though a somewhat complex species) of the black fungi, and its reproduction may be taken to represent that of the whole group.

In the spring of the year the parasitic threads of the black knot multiply in the young bark and wood, forming the well-known, knot-like mass. It is composed of the threads of the fungus, intermingled with an abnormal development of the tissues of the host plant. The knot at this time is dark-colored, and has a velvety appearance, due to the fact that its surface is made up of myriads of short fungus threads, which stand vertically. Each of the latter bear one or more minute spores, which are very easily detached. These are the non-sexual spores, spoken of above as the contagious elements of the fungus.

During the latter part of summer there are formed spore-sacs for a reproduction of another kind, and which is probably sexual in its nature. The knot begins to harden externally and internally, and to form minute, wart-like excrescences. In the latter are the spore-sacs, which, in the winter, perfect their spores. If a knot of this fungus be taken in mid-winter and careful sections made of it, the small sacs and their contained white spores may be readily seen under a moderate power of a microscope. During the latter part of winter these spores drop out, and are doubtless blown away by the winds. They germinate by protruding a tubular thread, which eventually finds its way into the tissues of its host.

Now, there are many fungi which pretty certainly belong to the black fungi, of which we only know the first mode of spore formation. That is, we have been able to trace their life-history only as far as to the development of their non-sexual spores.

In this list we must place the fungus which causes "strawberry rust" (*Ramularia tulasnei*), that which the spotting of horse-radish leaves (*Ramularia armoraciae*), the parsnip fungus (*Cercospora apii*, var. *pastinacae*), the "beet rust" (*Cercospora betaeicola*), the "leaf blight" of the apple (*Fusicladium dendriticum*), which has lately been shown to be identical with the "apple scab," by Prof. Trelease, the bean fungus (*Glaeosporium lindemuthianum*), which causes the destructive spotting of beans, the dry-rot fungus of the grape (*Phoma uvicola*), etc.

Here is, indeed, a rich field for research for the economic fungologist.

THE RUSTS. (UREDINEÆ.)

The last family which I will take the time to notice in this rapid review is that of the rusts, as they are popularly and very appropriately called. They are all small internal parasites. They present a good deal of variation as to the complexity of their life-cycles, but agree sufficiently, so that all can now be readily compared with one another.

In the most complete species there are no less than five distinct kinds of reproductive bodies produced. There is, first, the cluster cup stage of the fungus, consisting of little cup-shaped structures, filled with orange spores. With these structures there are usually others of a flask shape (*spermatogones*), producing minute colorless spores (*spermatidia*), whose function is entirely unknown. The orange-colored spores, known as *acidiospores*, germinate readily, and the filaments developing from them bore into the new hosts; from this new growth there are produced a little later many groups of stalked spores, each spore being rounded and supplied with a stalk double or treble its length. These burst through the epidermis of the host, and as

they form reddish patches, this is known as the red rust stage, and the spores are red rust spores (*uredospores*). These are here the particular elements of contagion. They are blown freely from plant to plant, and in warm, damp weather germination takes place at once, resulting in the rapid spread of the disease. This production of red rust spores goes on so long as the tissues of the host, and the other controlling conditions are favorable, and then another kind of spore is developed. This fourth spore is thick-walled and often dark-colored. It is frequently two or more celled, and is always provided with a little stalk. The dark color of the spores gives the spore clusters a black appearance; hence, this stage is known as the black rust stage, and the spores are called black rust spores (*telentosporos*). These thick-walled spores are admirably adapted for resting spores, and we find that in fact they are such. In the common rust of wheat, the black spores remain quiescent upon the rotting straw until the advent of the warm, wet weather of the spring, when they begin to germinate. In germination they send out a slender thread, which soon produces a few excessively minute spores (*sporids*). The latter, the fifth of the series of spores, on account of their minuteness, are readily carried by winds, and are thus disseminated. When the sporids alight upon a moist surface they germinate, and if the surface is a leaf of the right species, the young parasite enters and begins anew the round of life.

Many species of rusts abridge somewhat the round of life given above, and indeed, it appears from the observations of Mr. Charles Plowright, in England, a couple of years ago, that the same species may abridge or not abridge its life-history, according to circumstances. He found that, whereas the common wheat rust (*puccinia graminis*) normally has all the stages just described, under certain circumstances, the cluster-cup stage is omitted. When the black rust spores germinate in the presence of very young seedling wheat plants, the sporids of the parasite have sufficient strength to penetrate the tender epidermis of the young wheat leaves. When the wheat seedlings are older, the epidermis becomes too tough and hard for the delicate fungus thread to penetrate. It can, however, gain access to the tissues of the young barberry leaves, and here it grows and gains strength to produce the cluster-cup spores mentioned above.

Now, if we look over the several stages of rust we observe that, as in previous fungi, there is a non-sexual production of spores which marks the contagious period of the parasite. This is the so-called red-rust stage, and here the rapid spread of the rust takes place. A single affected plant in a wheat field may, under favorable conditions, thus become a center from which the parasite may spread to all parts of the field, just as a single small-pox patient may become a center of contagion in a neighborhood.

Notice again, that the black-rust stage is that in which provision is made for a period of resting in the cycle of the parasite. This is the quiescent stage as contrasted with the active stage of the red-rust period. There is here no contagion, and so in one sense this stage is much less harmful than the preceding one. When, however, we remember that these black-rust spores are the means of carrying the parasite from year to year, and from crop to crop, and realize that they are in this way the cause of the rust each season, we are ready to say that they are even more dangerous than the red-rust spores.

REMARKS UPON REMEDIES AND PREVENTIVES.

In a general paper like this, it is manifestly impracticable to take up specific remedies; in fact, it would be impossible to intelligently discuss particular remedies without a previous discussion of particular fungi. My purpose has been mainly to direct your attention to the great families of harmful fungi, and to the fact that they produce disorders of various kinds in the higher plants. It now remains for me to discuss in the same general way the remedies and the preventives.

Let me insist now upon the need of keeping clearly before you the fact that there are two things which we must consider in all this discussion, namely: (1) the fungus; and (2) the disease which it produces in the plant. The fungus is a plant, and as such is subject to the varying conditions with which it is surrounded. It grows best under certain conditions. It languishes under others. It may be killed by certain poisons, or, on the other hand, it may be stimulated to greater activity by other means. Let us not forget, then, that the fungus involved is a real plant, which is at all times as subject to its environment as are the larger plants with which we are much more familiar.

Again, you remember that nearly every fungus produces resting spores of some

sort. These appear when the fungus itself dies. Now, here we have again the opportunity of destroying the parasite. Take the case of the rust of the wheat, where the resting state is the black-rust on the straw and stubble; if we destroy these black spores, we prevent the formation of the sporids, which otherwise would germinate from them. Now, as I said before, nearly every fungus has its resting state, and if we are wise we will attack it here and destroy it. The dead leaves and twigs, killed by the fungi of the preceding summer, should be burned during the fall and winter, lest they afford shelter to the resting spores, which will spring into activity upon the return of favorable weather.

I come now to the use of poisons, or fungicides, and will detain you but a short time upon this topic.

There are many substances which are poisonous to the spores or other parts of the fungi, and any of these may be used in their destruction. I may mention sulphur, and the many sulphur compounds—iodine, salicylic acid, borax and its compounds, as among the most prominent of these. They may be applied in destroying the spores, as when the farmer washes his wheat in a solution of copper sulphate (blue stone) in order to destroy the spores of smut, or they may be applied upon the growing fungus in order to kill it, as in the application of sulphur to kill the mildew (*erysiphe*) upon rose leaves in the conservatory.

Now, in the use of such applications, it must be borne in mind that these fungicides are of value only when they come in direct contact with the fungus. Sulphur, for example, is of use only in the case of those fungi which are upon the surface of plants, while it is utterly useless in case of internal parasites.

I have now attempted to lay before you the general facts as to the structure and habits of the harmful fungi, and to make some general observations upon remedies and preventive measures, in the belief that such information and suggestions laid before you may be as seed sown upon good ground. May I venture to hope that what has been said may prove of use and value to you, and that it may contribute somewhat to an increased study of the parasitic fungi, and the diseases of plants which they produce.

On Thursday morning, Prof. J. C. Arthur, of New York, read a paper, giving an account of his experiments in producing pear blights by means of inoculating healthy trees, artificially, with the substance containing germs from diseased trees, as demonstrated some years ago by Prof. Burrill, of Illinois, whose investigations have heretofore been published. Mr. Arthur's observations have been carried still further, and seem to confirm the opinions of Prof. Burrill as to the cause of this perplexing and destructive malady. The following extracts give the main points of the paper, and about all that has not heretofore been published:

PEAR BLIGHT.

By PROF. J. C. ARTHUR, OF NEW YORK.

There are undoubtedly a number of things confounded with pear blight. I shall speak of only one disease. This shows itself by the limbs turning brown and dying in a few days. The dying limbs give out a peculiar odor. The appearance of a blighted branch does not differ in any respect from that of a branch dying from any other cause. In the pear, the leaves turn black and the disease is readily noticed, but in some other plants they only turn brown, so the disease is not so readily seen.

Most of us have probably observed that a diseased limb exudes a gummy substance. If a little of this matter be transferred to a healthy limb, it will produce the disease. My first experiment was to transfer a minute quantity of this gummy substance, and by means of a pin, prick it into the tip of a growing pear limb. In these cases, the disease invariably followed, generally in about two weeks. If the germs were inserted in an older limb, it sometimes failed. More than one hundred and twenty of these experiments were recorded with all the data, in the note books of the experiment station.

It may be objected that disease would follow the pricking of a limb anyway. To determine this, I made some wounds in limbs in which I inserted none of the germs, and in no instance was there any disease in these cases. There were no cases of pear blight within a mile and a half, and had not been that season; so there was no danger from contamination from such a source.

I found that the progress of the disease was most rapid in warm weather, and during July. None of the experiments succeeded after the 2d of August; that was because I could not find any tissues sufficiently tender. My best results were obtained by inoculating into the young fruit.

Now the trees are diseased in the spring, the disease showing itself most in July. As the disease progresses, the germs exude on the surface and the gummy substance is washed off, the gum is dissolved and the germs set free and washed into the ground. The germs multiply there in rich mold and grow all winter, or year after year. In a dry time the wind takes up the germs into the air or they may also be taken up by simple evaporation. Now when the surface of the tissues is tender and moist as in spring, the air laden with these germs playing over these trees brings the germs in contact with the delicate tissues; the germs are held there by the moisture and enabled to grow, the disease gets a foothold, and in the course of a month or two it shows itself by the sudden blackening of the leaves.

This season in observing the pear trees, I found that in many cases the blight entered by the flowers, for some were found no farther advanced than when they opened, when elsewhere the fruit was half grown.

I found, however, that there were many limbs blighted on which there were no flowers. In all these cases they were vigorous shoots, and the blight had begun at the tips of the shoots, so that only the youngest leaves were dying. These facts indicated that the blight entered the tree through the flowers and youngest parts, and no later than the 20th of May, though it took a month before it showed enough to attract attention.

I performed my inoculations not only on the pear, but also on the apple, hawthorne, service berry, quince, and other trees. In all cases the same disease was produced, whether the germs were from the pear or from any of the others. The disease varies only on account of the difference in the tissues, i. e., in the apple, which has more solid wood than the pear, the disease does not progress so rapidly, and does less injury, generally stopping after going six inches or a foot, and seldom killing the tree. But there was still much to explain about the disease. If it did not enter through the branches, how was it propagated from tree to tree?

Not all bacteria will produce pear blight. I wanted to show that while the germs of the pear blight produced the disease, it was only one particular kind that produced it. I took various germs from rotting substances and inoculated trees with them. I first tried the material which produces the rot in green tomatoes, but in no case did I get any effect. I also used bacteria from various other sources. I am carrying on, with my experiments on pear blight, cultures of bacteria of various kinds, and I inoculated pear limbs with all the various sorts, and with none of them did I get the blight. The germ producing the blight is *Micrococcus amyloporus*.

These experiments, carried on for two seasons, show that the disease is due to germs communicated through the young growing branches, or through the flowers; that they multiply in decaying matter; that it is only the germs and only one specific kind of germs which produce it.

Mr. Joseph Lannin, of Michigan, inquired if the inoculation of one twig would disease the whole?

Prof. Arthur: It would depend on the tree and the weather and various other things. In young pear trees it seldom does, and in the apple it is doubtful if it ever does. In the apple and quince it usually progresses only down to the first limb and is therefore called twig blight. In the pear it may stop at any point or it may progress till the whole limb is killed. You have probably observed that the blight sometimes appears on the body, seeming to have entered through the bark. I think you will always find in such cases that there was a little shoot at that point which was first killed and through which it entered. If this spot appears below the lowest branch the tree is doomed.

It has been asked whether there is any danger of communicating the disease with the pruning knife. I performed some experiments to determine this. In the first place it seemed that there would be no need of it from my not getting good results except on young issues; but to be perfectly certain I tried a number of experiments. I took the knife and drew it through diseased branches, then cut off limbs with it of different sizes, keeping a record of them. In no case did I communicate any disease, except when I cut off a very tender twig.

I also took diseased pears and drew my knife through those and then cut off limbs with the same results. In no case did I communicate any disease to large limbs. Hence there is no necessity for being careful to disinfect your knife. In any case it would be easier to cut off the limb a second time rather than go to that trouble. In cutting, the limb should be taken off a foot below the lowest joint where the blight appears.

Mr. Lannin: Is there any prevention?

Prof. Arthur: No, sir, you can do nothing to restore it. Theoretically an antiseptic might have some effect, but the germs are most likely to enter in a wet time when any application of that kind would be likely to wash off.

E. Moody, N. Y.: We have whitewashed with lime and sulphur and have had no blight for five years.

Prof. Arthur: I do not see how the washing of the trunk of the tree, or the application of any thing to the roots can have any effect on the pear blight. Sulphur is a specific against bacteria, but you have got to bring it in contact with them.

Mr. Moody: One can smell the whitewash for a month. We haven't lost a half dozen trees by blight in over ten years, while others in our neighborhood have been troubled with it.

Prof. Arthur: If by any process you can induce your trees to grow slowly, you will, to a large extent, prevent the introduction of the blight.

Mr. Moody: I would as soon burn my orchard as seed it down.

W. C. Strong, Mass.: Can we fumigate? Will the fumes of sulphur do any good?

Prof. Arthur: It is doubtful if that would do any good in the open air.

The following telegram was received from President Wilder in reply to the announcement of his re-election, and greeting from this Society:

To the American Pomological Society in session at Grand Rapids, Michigan:

Many thanks for the telegram of greeting and congratulation. I accept the trust you have again put in my hands. Go ahead, and may God bless the grand old Pomological Society.

MARSHALL P. WILDER.

DORCHESTER, MASS., September 10, 1885.

The following paper from Prof. Burrill was read by the Secretary:

GRAPE ROTS.

BY PROF. T. J. BURRILL, OF THE ILLINOIS UNIVERSITY.

Our knowledge of the fungi which destroy the grapes to so great an extent in this country, has not been materially increased during the few years past. Fortunately the process of bagging the bunches while these are still very young, provides a method of securing the fruit against all these parasites, whatever their names or life histories.

I wish, however, to call attention to the fact that what the French call *anthracnose* of the grape exist also in the United States, and is probably widely distributed. No doubt it is an importation from abroad, and we may suppose that the disease producing fungus has reached our country during recent years. It was first observed by me in central Illinois in 1881, and has not until this day been identified, to the best of my knowledge and belief, by any one else. But it certainly devastated our vineyards before the date mentioned, and is now known to occur over wide areas of our country. I have found it in Illinois in numerous localities, in Indiana, near Indianapolis, in Michigan, at Lansing, and in Ohio at Cleveland.

With most persons grape rot is grape rot, without a thought as to the possible existence of several kinds. We must here, however, carefully discriminate between four distinct kinds, each produced by distinct fungus parasites. On the fruit, two of these are first observed in circular spots, clearly marked and sharply defined at the edges. The other two affect from the beginning the whole berry, causing change in color—usually pinkish—and ultimately uniform shrinking or

rotting. Of the two latter, one fungus lives entirely on the outside of the leaves and fruit, having a thin, cobwebby growth, and two kinds of spore fruits. The other sends its vegetative filaments through and through the tissues, and at length produces on the surfaces of leaves, and less, often berries, what appears to the naked eye a white, mealy substance, usually in clusters or irregular spots. This last is far the more common of the two. It is *peronospora viticola*. The first is *uncinula spiralis*.

But, so far as my observations go, neither of the above caused so much damage to the fruit directly as those to be described. They are primarily leaf parasites, and as such may be seriously destructive without actually preying on the berries. The two kinds beginning with well marked spots on the fruits, are, however, specially injurious to the latter, rather than to other parts of the vine. Upon close observation these two can be easily recognized, the one from the other. One is a true rot, the other simply kills the outer tissue, as in the so-called scab of apples. In one case the first indication of the disease in a grape berry is a small, brown spot, usually with a minute, central, lighter dot or point. As the disease progresses the brown area enlarges, the skin for some time remaining plump and unbroken. The inner substances becomes watery, and merits the name rot. Finally, the whole fruit is involved, and shriveling soon occurs. During this time, if one looks closely, especially with a magnifier, minute black pustules can be seen pushing out beneath the skin. Each one of these has at length an external opening or mouth from which issues as the fruit shrinks myriads of white spores. These latter may be seen in little heaps, or scattered like a whitish powder on the shriveled berry. We have in this fungus whose name, *Phoma uvicola*, has become well known to lovers of the grape. It does occur on the leaves, but not commonly, nor to an injurious extent, except in rare cases.

We have now left, the special disease, which prompted this writing. As said above, the effect on the fruit is, like the last, first seen in a definite spot or circular area, with well defined edges. At first this is a mere point, then gradually increases in size so as to cover one-sixth, one-fourth, or even one-half the total surface area. More often there are several such spots which more or less coalesce as they enlarge. At first, and while the spot is very small, the color is whitish, but as the affected area increases, the central part becomes blackish, while near the edges the white color is retained as a rim, which is also lightly raised. Only the surface is affected. The tissue just beneath remains green and apparently healthy. But growth is prevented. The affected area becomes apparently sunken by the increase in size of the other parts of the berry. Sometimes the seeds, perfectly developed, push partially out of what should have been the pulp of the fruit. Often the deadened surface cracks more or less deeply, altogether similar, except on a smaller scale, to that of crab apples and pears.

Really, however, the worst effects are produced on the green shoots of the vine, where spots like those of the berries are to be seen, often very numerous and conspicuously injuring the growth. Similar effects occur on the petioles and larger veins of the leaves as well as on the tendrils and stems of the fruit. In all cases the disease is worst in damp situations. When branches of the vines tragle over or near the ground among weeds, etc., during rainy weather, they become extensively marked with the characteristic spots.

The disease can be readily transferred artificially from an affected to a healthy berry. It is only necessary to wet with water a diseased spot and after stirring with a little brush, remove some of the water to a healthy fruit where it may stand as a little drop. If this is done when the air is saturated with moisture failure to communicate the disease rarely happens. If quite dry only an occasional experiment is successful. With the microscope the minute spores are easily found and their germination and penetration of the healthy skin can be watched. This disease has long been known in Europe and sometimes does great damage. More recently one *Phoma* has also gained introduction to the vineyards of the old world. We have therefore exchanged parasite for parasite to the detriment of both countries. Scientists know the European fungus by the name of *Sphaeceloma ampelinum*.

The methods of preventing all these forms of rot are similar. What is required is to keep dew, rain, etc., off the parts liable to attack. The spores of these fungi do not germinate on dry surfaces, no more than grains of corn germinate on a dry floor. Bagging does this and more besides, for the spores are kept entirely off the berries. The success attending bagging is an excellent popular demonstration of the fact, well known to the specialist from other sources of knowledge, that these fungus parasites always start on the surface, are never carried in any manner in the circulating sap. Roots are seldom affected because so well protected in the soil. Partial

protection is secured by training the vines under projecting eaves or other shelter, and good results are reported from the use of one or two wires, high up from the ground, along which the vines are closely grown, the leaves compact and roof like. The fruit hangs beneath and is considerably protected from falling water, while the radiant heat intercepted by the foliage prevents the condensation of dew. At the same time good ventilation is secured by the height of the vines and the open space beneath.

Good results are also reported, especially with *anthracnose* by systematically and persistently removing and burning affected portions of the vine. This must of course be done for the whole vineyard, and, in case of near neighbors, for all alike.

A paper was read by Prest. T. T. Lyon, of Michigan, upon the "NOMENCLATURE OF FRUITS," advocating short and appropriate names; the following extract expresses very clearly his views upon the subject:

"What classes of names are to be preferred for fruits may fairly be regarded as an open question. We esteem brevity as always and everywhere desirable. The name of the originator or introducer will rarely be found inappropriate, and the same is true of the name of the place origin, while either will generally possess the advantage of requiring but a single word; while the wish to add a characterizing word but too commonly finds expression in the use of such titles as Pippin, Pearmain, Superb, Favorite, or Beauty, or of political or military designations, designed to convey the impression of superiority, but which have been heretofore so loosely employed that they have to persons of experience at least, long since ceased to convey the impression intended. We cannot too strongly insist that more than a single word will rarely be found needful, and that if characterizing words be employed the strictest honesty in their use be rigidly adhered to."

The following note from J. J. Thomas, of Union Springs, N. Y., on the same topic, was read by the Secretary:

"According to request, I give the following brief suggestion in nomenclature for the Grand Rapids meeting:

"There are two great foundation principles in nomenclature—to insist on compact, expressive and appropriate names, and to give to pomology the truth and dignity of science, and to prevent it from becoming degraded into peddler's puffing.

"A name may designate the locality of origin, name of originator or of an eminent pomologist (not of a politician or warrior), and still better, one indicative of its appearance or other characteristic.

"It should not be some body's 'prolific,' or 'giant,' or 'favorite;' not a superlative, bombastic, frothy or strained name.

"For strawberries; such names as Crimson Cone, Necked Pine and Red Alpine are much better than Wizard of the North, Great American, Defiance, Mammoth, Monarch of the West, etc., etc. Golden Cap Raspberry is to be preferred to Pride of the Hudson; Nivette and Lemon Cling are better than Admirable, Incomparable, Royal George, or Stump of the World."

T. T. Lyon then offered the following resolution, which was read and referred to the Committee on Resolutions, and subsequently reported favorably and adopted by the Society:

Resolved, That, in all cases in which new, newly named or recently introduced fruits shall for the first time come under the consideration of the Society, it shall be the duty of the presiding officer to first submit the *name* of the variety for approval; and that, if objected to, the variety shall be designated by the name of the originator, that of the introducer, or of the place of origin, as the Society shall direct, pending the designation of a suitable name, as provided in Rule 2, Section 1, of the Society's rules, and the approval of such name by the Society.

The question of the "Influence of Pollen on the Form, Size, Color, and Flavor of the Fruit," was discussed at some length, as shown by experiments mainly with the strawberry. Prof. W. R. Lazenby described the experiments made at the Experiment Station, at Columbus, Ohio, in which his first efforts seemed to demonstrate that the pollen from various kinds of strawberries ap-

plied to pistillate varieties had the effect of imparting to them, in a marked degree, the characteristics of the staminate varieties. Subsequent experiments were not successful in determining the correctness of his first impression, as "there were no very marked resemblances this year between the berry and the variety which furnished the pollen."

Prof. T. J. Burrill, of Illinois, furnished a paper on the subject, in which he says:

"I am unable to detect any difference in the fruit of pistillate strawberries on account of the kind of pollen used for fertilization. Observations have been mainly made upon Crescent as grown in the field, and as tested in experimental plats. For the former, pollen was furnished by Sharpless, Captain Jack, Wilson, and Glendale."

A paper was also read from A. S. Fuller, of New Jersey, stating that sometimes the pollen seemed to have an effect in transmitting its peculiar characteristics to the fruit of pistillate varieties; and at other times no such results followed. The following is an extract from his paper:

"About the time I wrote the 'Strawberry Culturist,' 1862, I called the attention of several of my acquaintances to this subject of the influence of the pollen on the quality of the fruit, and their reports were so uniformly in accord with the results of my own investigations that I felt warranted in writing the following paragraph in addition to those already quoted, to wit: 'It is often asserted that the Hovey is better when fertilized with one kind than with another, and may not this be true, further than that of being fully supplied with pollen?'"

The following note on the subject was read from M. Crawford, of Ohio:

"Some months ago, at your request, I promised to write a paper on the 'Influence of Pollen on the size, form, color, and flavor of Fruits.' So far as the strawberry is concerned, I have had excellent facilities for making observations, and I have yet to find any good evidence that the influence of pollen extends beyond the seed."

Prof. J. L. Budd, of Iowa said:

"Some fifteen years ago, I tried some more definite experiments to determine this matter. I had several rows of the Colfax, an acid berry, and planted by one part of the rows the wild strawberry; by another piece about ten rods away, the Wilson; by another the Downer's Prolific. When the Colfax plants were fertilized with the wild strawberry they were small and sour; when fertilized by the Wilson, larger and sour; when fertilized by the Downer's Prolific, lighter in color, rounder and sweeter. These changes were perfectly evident. We now grow the Charles Downing, and fertilize with Downer's Prolific. The Downing does not do well as a self-fertilizer, but needs more pollen; besides, we think the cross makes it larger and better in shape."

The discussions and papers upon the subject left the impression that, while the pollen did seem, under some circumstances, to influence the color, size, form, and flavor of pistillate varieties, the results were by no means constant, and were, to say the least, only occasional in their occurrence.

The following was presented by the committee:

REPORT OF COMMITTEE ON FRUITS EXHIBITED.

GRAND RAPIDS, MICHIGAN Sept. 10, 1885.

To the President and Members of the American Pomological Society:

Your Committee on Fruits Exhibited, report the following awards:

WILDER MEDALS—SILVER.

Michigan State Horticultural Society, for 547 plates of apples, 23 plates of crab-apples, 152 plates of pears, 68 plates of plums, 34 plates of peaches, 69 plates of grapes, 4 plates of raspberries, 4 plates of blackberries, 1 plate each of quinces, Japanese persimmons, and cranberries: total, 838 plates.

Ohio State Horticultural Society for 56 plates of grapes, 34 plates of apples, 24 plates of pears; total, 114 plates.

Missouri State Horticultural Society, for 146 plates of apples, 42 plates of pears, 20 plates of grapes, 3 plates of peaches; total, 211 plates.

Ellwanger & Barry, Rochester, New York, for 140 varieties of pears.

Benjamin G. Smith, Cambridge, Massachusetts, for 61 varieties of pears.

Peter M. Gideon, Excelsior, Minnesota, for 28 varieties of crab-apples and apples of his own origination.

Field & Osborn, Red Bank, New Jersey, for collection of cocoanuts grown by them in Dade county Florida.

In appreciation of the valuable and untiring services of Prof. Wm. J. Beal, our retiring Secretary, we recommend the presentation to him of a silver Wilder Medal.

WILDER MEDALS—BRONZE.

Henry M. Eagle & Son, Marietta, Pennsylvania, for 28 varieties of pears, 27 varieties of grapes, 3 varieties of peaches, 2 varieties of apples, and a specimen of Great American Chestnut, worthy of special mention.

A. J. Caywood & Son, Marlboro, New York, for 3 new varieties seedling grapes.

George W. Campbell, Delaware, Ohio, for 6 new varieties seedling grapes.

W. W. Thompson, Smithville, Georgia, for collection of pears, grapes, figs, Japanese persimmons, and pomegranates.

A. Block, Santa Clara, California, for 4 new varieties of seedling pears.

Professor L. H. Bailey, Jr., Agricultural College, Michigan, for 75 plates of berries, nuts, and other native fruits.

T. V. Munson, Denison, Texas, for 12 varieties of seedling and native Texan grapes, also plums and peaches.

HONORABLE MENTION.

J. Nimon, Denison, Texas, for 12 plates of apples, 4 varieties of peaches.

L. A. Goodman, Westport, Missouri, for collection of apples, pears, and grapes, kept two years in cold storage.

J. S. Owen, Saugatuck, Michigan, for Early Rivers peach.

S. H. Comings, St. Joseph, Michigan, for exhibit of cranberries.

OTHER EXHIBITS.

We also report the following exhibits:

J. J. Toon, Atlanta, Georgia, Edmund and Bartlett pears.

John H. Parnell, West Point, Georgia, collection of peaches.

O. M. Lord, Minnesota City, a new native plum, Rolling Stone.

John C. Ratliff, Richmond, Indiana, seedling pear.

"Prairie Farmer," Chicago, Illinois, seedling plum.

E. W. Daniels, Aurora, Wis., 3 plates of apples, North-western Greening.

J. G. Kingsbury, Indianapolis, Indiana, seedling pear, Warner.

C. A. Green, Clifton, New York, Lord Nelson apple and seedling pear.

John S. Collins, Moorestown, New Jersey, 2 plates Comet pears.

Gideon N. Greer, Philadelphia, Penn., Mangoes and Alligator pears.

James Beltner, Riverside, California, Mediterranean sweet oranges, crops of 1884 and '85, mostly picked August 5, 1885.

H. S. Anderson, Union Springs, New York, plums, "Shipper's Pride."

Bush and Son and Meissner, Bushburg, Missouri, 7 varieties of grapes.

Prof. A. J. Cook, Agricultural College, Michigan, 5 plates of apples.

G. W. Price, Turner's Creek, Maryland, peaches.

S. T. Jenkins, Baltimore, Maryland, grapes.

G. P. Pfeffer, Pewaukee, Wisconsin, 5 varieties of apples and crab apples.

Niagara White Grape Co., Lockport, New York, Niagara grapes.

Daniel Duer, Millersburg, Ohio, 15 plates apples.

E. T. Field, Middletown, New Jersey, new seedling apples.

Pratt Brothers, Rochester, New York, Empire State grape and New Brunswick apple.

Mr. Moahr, Grand Rapids, Mich., Chinese lemon.

J. H. Tyron, Willoughby, Ohio, 3 varieties of grapes, 2 varieties of pears.

Jenkins, McGuire & Co., Baltimore, Maryland, fruit shipping crates.

Your committee cannot close their report without special honorable mention of the highly meritorious collection of one hundred varieties of pears exhibited by our ven-

erable friend and President, Hon. Marshall P. Wilder. Although it was not his wish that it should come into competition with other exhibits, nevertheless in consideration of its excellence as well as of the invaluable services of the exhibitor to the cause of pomology, your committee unanimously recommend that the Wilder gold medal should be awarded to it.

Respectfully submitted,

F. M. HEXAMER,
A. W. HARRISON,
ROBERT MANNING,
J. J. HARRISON,
T. V. MUNSON.

E. Williams, of New Jersey, made the following good points, in a paper upon "Small Fruits:—"

From the standpoint of a producer and consumer, the essential elements this class of fruits should possess, I name as follows:

First, Constitutional vigor of growth.

Second, Healthy and abundant foliage.

Third, Hardiness in summer and winter.

Fourth, Productiveness.

Fifth, Quality. This should be good to very good, or best; if below good, as a consumer I have no use for it.

Sixth, Marketing qualities—the ability to stand carriage. This with many growers would take precedence of the previous one, and, where money is the sole object in fruit growing, this is one of the most important considerations; but I am a poor salesman to dispose of a fruit that I cannot commend for its goodness in other respects.

No mere money considerations should induce any one to introduce a new fruit unless it possesses some points of superior merit over those of the same class now before the public, and no true horticulturist would do it.

The following embodies the principal, and most valuable portion of the discussion upon

STRAWBERRIES.

A. W. Harrison, Pennsylvania: Is there any thing by which we can judge of the quality of fruits by their appearance? Thirty years ago I grew sixty varieties of the strawberry, and the best among them was the Peabody, which had a very long, slender, and silky, tapering neck, like some of our wild sorts, and I never knew an inferior strawberry with that mark.

J. B. Rogers, New Jersey: I believe that is a general characteristic of excellence.

F. M. Hexamer, New York: The Henderson is like the Peabody in that respect, and is as good or a better berry.

G. G. Bennett, Michigan: I would like to have Parker Earle tell us what varieties he cultivates mostly, and why.

Parker Earle, Illinois: I succeed in growing the Crescent, and generally fail with nearly all others in producing profitable crops. I have used Wilson, Captain Jack, Champion, Downer's Prolific, Sharpless, and others to fertilize with, I think quite successfully; but we now use the Sharpless almost exclusively to fertilize the Crescent. I plant with reference to what I believe to be a decided effect of the fertilizing varieties upon the fruit. I cultivate in matted rows.

N. J. Colman, Missouri: Why do you use the Crescent and not the Wilson?

Parker Earle: Because we can grow it.

C. A. Green, New York: I find good qualities in many different strawberries; but have not settled on any one variety.

N. J. Colman: Soil makes a great difference with varieties, and I have found on a rich soil, with clay sub-soil, that the Wilson is a very good berry.

Near St. Louis the Crescent does not compare in market, shipping qualities, or productiveness with the Wilson.

Parker Earle: We think in Southern Illinois that we can grow very successfully about all the kinds that any body grows. The rust, however, prevents the culture of the Wilson there, so we use the Crescent, which largely escapes it. Another difficulty, especially in the last four or five years, is the tarnished plant bug, which attacks the fruit. I would prefer other kinds to those which I raise if I could produce them.

D. T. Fox, Michigan: I have planted the Manchester, fertilized with Wilson, and have had twice the number of berries from the Manchester as the Wilson, and the former sold for $12\frac{1}{2}$ cents, while the latter brought but 10 cents.

Mr. Morrill Mich.: At the mouth of the St. Joseph we often ship ten thousand bushels of an evening. We have all varieties, but I believe that the last two years' experience has pretty generally convinced our people that we have but two market varieties—Crescent for light soils and early, and Sharpless for heavy soils and a late market. We have too many Wilsons to suit the market, and it rusts badly. I have Sharpless, Crescent, Manchester, Vick, Wilson, and Bidwell in rows in my garden, and the Wilson bears less than any other, and the Crescent more than any other, and is the earliest. The Manchester is very good and very productive, but must be picked carefully or it will come off without the calyx. It is a fine family berry, but turns too dark on exposure to the air to sell well in the market. Its form is even, its foliage rather tender. James Vick has very strong foliage, and is a strong grower. The berries are small until they begin to ripen, and then they increase in size rapidly. It is a promising shipping variety, of good color and sufficiently tart. These three varieties, Crescent, Manchester, and Vick are about the only ones that are all right.

Samuel Hape, Georgia: The Sharpless is the best berry in my neighborhood, near Atlanta. If I were to select the three best varieties, I should say Sharpless, Crescent, and Wilson. The soil in my locality is well adapted to strawberry culture. We have none of the difficulties Mr. Earle has mentioned. Strawberries grow wild in profusion.

H. M. Engle, Pennsylvania: We grow a large proportion of Sharpless. The Crescent is very productive, but does not sell as well. The Crescent has great tenacity, and will endure neglect better than many others, but no berry will be more improved by proper management and care.

F. M. Hexamer: I would like to ask Dr. Hape about the Newland strawberry.

Samuel Hape: It lacks quality. Its principal merits are its earliness and good shipping quality.

Mr. Morrill: The Sharpless is very susceptible to cold in the blossom; it is much more tender than Crescent and Vick, and must be kept back by mulch until the danger of frost is over. Mr. Morrill mentioned the great success with Sharpless about Barnesville, Ohio.

C. A. Uber, Virginia: The Sharpless does well with us.

D. W. Hinman, Michigan: I did not have success with Sharpless in New York, but it does well where I now am, near the mouth of the Kalamazoo River. Had a Sharpless this year $10\frac{1}{4}$ inches in circumference, weighing 3 ounces, 1.5 drams.

F. M. Hexamer: There was a strawberry exhibited at the New York Horticultural Society a few years ago called the President Lincoln, which was fourteen inches in circumference and three inches in diameter at its widest point.

John S. Collins, New Jersey: A berry known as May King has been grown two or three years in our part of the country, which is early and of good quality.

A. E. Gipson, Colorado: We grow the Sharpless very large, but we find that with us the berry is a poor shipper, and it is being discarded.

Mr. Morrill, Michigan: The Sharpless berries reach Chicago from Barnesville, Ohio, in good condition, about 400 miles by rail. I think your irrigation makes it a poor shipper.

Parker Earle: The shipping quality depends largely on the soil and manner of growth. As I grow and ship strawberries, the Sharpless is a good shipper. I have no difficulty in shipping it 1,000 or 1,200 miles by rail, and the same is true with all the strawberries I grow. In some soils, no strawberry will stand shipping.

BLACKBERRIES.

G. Cowing, of Muncie, Indiana, read a paper upon blackberries, from which we extract the following:

A deep and rich soil is necessary to the production of large and luscious fruit. To prevent the effects of drought, I regard a heavy mulch of leaves or straw as better than cultivation. The best wild blackberries are always found near brush heaps or rotten logs.

In planting, the rows should be seven and one half or eight feet apart, with an occasional interval still wider to allow a wagon to pass through with manure or mulching material. Plants should be two feet apart in the row, and I have found strong sucker plants to be quite as satisfactory as those from root cuttings. I recently pruned some rows of Taylor from sucker plants, transplanted sixteen months before, which were generally three and one-half feet high, three feet across the top, and which presented the dense and compact appearance of a well-kept hedge. For pruning such a line of plants, a grass hook or sickle is best.

To save time and labor, it has often been my practice when planting blackberries to plant strawberries in rows with them, and in rows midway between them. Some of my best strawberries this season were from plants set last year with blackberries.

All blackberry plants, when three feet high, should have their terminal buds nipped, to force them to throw out lateral shoots. A severe nipping is often necessary to produce a compact and sturdy growth, capable of resisting strong winds.

But few varieties of the blackberry worthy of general cultivation have yet been tested. The Lawton, introduced about twenty-nine years ago, was the first generally cultivated. Kittatinny followed it, and proved slightly hardier and of better flavor, but very liable to rust and not sufficiently hardy to be reliable in the West. Snyder, Taylor, and Wallace, all originating in Indiana, and Stone, from Wisconsin, have since been introduced and found to be the only sorts that can be profitably planted west of the Alleghanies and north of the Ohio River. They are all remarkably productive, vigorous, free from disease, and of the most luscious flavor. Snyder is the first to ripen, and its earliness is a strong point in its favor. When grown on rich ground its berries are above medium size.

The berries of Taylor and Wallace are larger than those of Snyder, and are hardly equaled in their exquisite flavor by those of any other variety, and I can think of no reason why they should not prove profitable in the South.

Western Triumph is often commended for its hardiness, but I have found it tender and disposed to rust. Its foliage and fruit indicate a close relationship to Kittatinny.

The following discussion succeeded Mr. Cowing's paper:

W. F. Bird, Michigan: I would like to ask how Stone's Hardy compares with Snyder?

T. T. Lyon, Michigan: I have grown Stone's Hardy for several years. It is generally too small. It is nearly as hardy as Snyder, very prolific, and of good quality. It is too small, however, for a successful market variety.

Mr. Johnston, New York: I have cultivated it three or four years, and it is perfectly hardy with me; is fully as good a bearer as Snyder, and a better berry. I believe all our hardy blackberries are small. It continues in fruit longer than any other variety.

J. C. Plumb, Wisconsin: Stone's Hardy originated in Wisconsin. It does well with poor care. The matter of hardiness is of little importance, as any

blackberry will do enough better for laying down to pay for the trouble. Stone's Hardy covers the fruit well with the foliage; in this it differs from the Snyder.

Charles A. Green, New York: It is fully as good as the Snyder and other hardy sorts.

J. S. Woodward, New York: I would like to inquire about the Evergreen blackberry.

Charles A. Green: The fruit of this is small and of no value. Its leaves remain through the winter. It is the same as that which has long been known as the Cut Leaf.

T. T. Lyon: I would like to hear something of the Early Harvest.

Mr. Morrill, Michigan: I had five hundred plants of this last winter, but laid all down but fifty plants. These killed to the snow line, and gave but half a crop. It yields well, and matures its last picking with the first picking of the Wilson. The berry is small and looks like the wild berry. It does not look small, however, because it is so uniform. It is a good shipper, and does not redden on standing, as some kinds do, for example, Lawton and Snyder. It looks as though it were varnished.

E. H. Scott, Michigan: It kills to the ground with me.

Jacob Ganzhorn, Michigan: It is a good grower, but killed to the ground with me last winter at —20.

T. V. Munson, Texas: The Brunton and Early Harvest belong especially to the South. The former is worthless except when fertilized by Wilson or some other sort. With the Early Harvest near, it becomes immensely productive. They ripen together, and are marketed together, and cannot be distinguished. The Brunton is the best shipper we have, and is the hardiest, *i. e.*, in ability to withstand rust and drought. The Early Harvest is good if it has plenty of moisture.

C. M. Hobbs, Indiana: The Early Harvest killed the two past winters with us. We are fruiting the Lucretia Dewberry, which is very productive, of large size and beautiful color, but poor in quality.

Mr. Johnson, Indiana: We have the Brunton, Early Harvest, Early Wilson, Jr., and Early Cluster, which all killed the past winter. The Western Triumph has never been winter killed, and bears good berries, of excellent quality. We get more pleasure, however, from the Agawam, which is perfectly hardy, a good bearer, and as beautiful as the Snyder or Kittatinny, while its flavor is better than that of any of the others named.

G. W. Campbell, of Ohio, in reply to Mr. Hobbs, said the Lucretia Dewberry was only poor in quality when picked before it was ripe. It does color before fully grown, or quite ripe, and in this condition is too acid. But when fully ripe, it is of the finest flavor.

Joseph Lannin: Will some one describe Taylor's Prolific?

E. H. Scott, Mich.: I have fruited it six years. It bears fully three-fourths as much as Snyder, is about a week later, of better quality, and does not turn red on standing, like the Snyder. My soil is clay.

J. C. Ratliff, Indiana: I have attempted to fruit it for several years, but it doesn't bear with me.

C. A. Green: Charles Downing considers it one of the best—the largest of the hardy berries that he has.

W. Phillips, Michigan: It does well with me, and is bearing a full crop this year, though the temperature fell last winter to 26°. The Early Harvest has killed to the ground the past three years.

C. M. Hobbs, Indiana: Taylor's Prolific originated near Spiceland, Indiana. In some localities it has given very good satisfaction. It is not as hardy as Snyder, but is reasonably productive, of larger size, and better quality.

T. T. Lyon, Mich.: There seems to be no difference in hardiness at my place, South Haven, between them, and the Taylor is nearly as productive as the Snyder. The Dewberry is as tender as the tenderest blackberry, and would winter-kill, were it not for being so close to the ground. The berries get sandy, however, unless the vines are raised from the ground in some manner. The Lucretia is a poor shipper.

Mr. Morrill: Taylor's Prolific has a pale green cane, unlike any other kind. With me it out-yields Snyder. It is larger, holds its color better, and is a better grower if anything. It throws up its canes early, so that they are troublesome to the pickers. I have the Ratcliff which I obtained from Mr. Taylor himself. It is too strong a grower for fruiting the best.

W. W. Hilborn, Ontario: I have tried to grow Taylor's Prolific six years, and never succeeded in getting any fruit. It is not as hardy as Kittatinny.

A. E. Gipson, Colorado: The question of hardiness is of no importance to us, as we cover all. We do not look for a variety that will stand our winters. We use a plow in covering.

J. C. Plumb, Wisconsin: The Ancient Briton has been very successful at Ripon, Wisconsin.

RASPBERRIES.

Mr. Plumb, Wisconsin: I would like to ask if the Caroline is hardy? It is said to be hardy in Dakota, but insipid.

Chas. A. Green, New York: We prize it for the table.

Mr. Redding: It is a good substitute for Brinckle's Orange.

T. T. Lyon: It drops its foliage sometimes, which causes the latter part of the crop to be poor. It has little tendency to make suckers. The fruit is soft.

J. B. Rogers, New Jersey: The foliage remains on with us, but it is too soft.

Mr. Johnson: It is fine for the table.

B. G. Smith, Mass.: It does well with me.

T. S. Hubbard, N. Y.: The Caroline does well with us, but is of poor quality.

G. G. Bennett, Mich.: Is there any difference between the Tyler and Souhegan raspberries?

T. T. Lyon: A difference in origin, but not in other respects.

Mr. Redding: The Souhegan originated in Mt. Vernon, New Hampshire, before the Tyler. The Tyler originated at Auburn, New York, by Nathan Tyler.

Mr. Johnson, New York: How is Shaeffer's Colossal liked?

E. H. Scott, Mich.: It bears more than any other variety. Its color is too ark for the Detroit market. It is the very best for canning.

P. M. Augur, Connecticut: It does well with us. It is a strong grower, good bearer of large fruit, which sells at a good price.

J. Ganzhorn, Mich.: It is productive, a large berry, fine for canning.

C. M. Hobbs, Ind: One of the strongest growers and most productive raspberries we have, and among the largest in size. It has a sprightly, pleasant acid flavor, and is one of the best for cooking.

B. Hathaway, Mich.: More hardy than most other raspberries—hardier than Gregg, Cuthbert, or Souhegan.

Samuel Hape, Ga.: It succeeds admirably with me.

T. V. Munson, Texas: Raspberries are all a failure in Texas.

C. A. Uber, Va.: The Shaeffer is fine with us, but not so good as Herstine.

W. C. Strong, Mass.: Shaeffer does well in Massachusetts.

Mr. Johnston, N. Y.: I believe we have no variety of fruit that is worth so

much. It is especially fine for evaporation. I never saw but one person who complained of its flavor.

G. G. Bennett, Mich.: Its color is against it. It is too soft to ship. Its color is better if it is picked early. It is hardy here, of the largest size, and one of the best bearers. For canning it is the best, still it does not sell well, though Mr. Garfield succeeds better with it than the rest of us in the Grand Rapids market.

F. M. Hexamer: I believe that if people could eat it with their eyes shut, it would be a profitable berry; but it don't sell; in large cities they will not have it. It does very well to talk about educating the people's taste, but it is not profitable.

L. R. James, Ohio: It sells in Cleveland, when once introduced.

Geo. J. Streater, Ohio: It is the best for our village market.

J. S. Collins, New Jersey: It is of no value for New Jersey.

N. Ohmer, Ohio: Though excellent for cooking, it brings the lowest price in the Dayton market. In the long run, however, it probably pays on account of its size and quantity. It is hardy.

T. V. Munson: I would like to hear how the Marlboro withstands drought?

Samuel Hape, Ga: I have tried it one year, and it has stood the sun very well.

J. S. Collins, N. J.: It is a fine, large, showy, beautiful red berry, which ripens early, but uneven, and is of poor quality.

P. M. Augur, Connecticut: It is early and productive, but the quality is not of the best.

C. A. Green: I see no reason why it should not become popular, though it is not of high quality.

C. M. Hobbs: It is vigorous, hardy, productive, of good size, firm enough to handle, of fair quality—equal to Hansell.

A. E. Gipson, Colorado: I am much pleased with it. It is valuable for market—large size, good form, quality fair, good color.

Mr. Morrill: I would like to hear about the Rancocas. It is said to ripen its crop within ten days.

J. S. Woodward: It is early and very good.

At the Friday morning session Commissioner Coleman, of the Department of Agriculture, being present, was called upon for some remarks on what the Department can do to promote the horticultural and pomological interests of the continent.

Mr. Coleman said:

MR. PRESIDENT AND GENTLEMEN: I feel complimented by being called upon to make a few remarks to this body. As has been said by my friend, Dr. Hexamer, I believe that I am the first commissioner who has been appointed to take charge of the agricultural interests of our country, who by taste and profession was a horticulturist. And I have said in former years, before I had the honor of being appointed to this position, that much might be done to advance the interests of pomology and horticulture generally. * * * * *

I came here, gentlemen, to learn. I knew that I should meet here the advanced thinkers and progressive men in regard to the agricultural and horticultural interests—for horticulture is but a higher and more elevated branch of agriculture, and in horticulture we find our closest students, our best thinkers, and our most progressive men, and our most philanthropic men. Now there are various things to embarrass the department at present in advancing our interests. Take, for instance, the collection of statistics. Everything relates to the grain crops only. No efforts have been made to ascertain anything in regard to our fruit crops. There is no way by which we can tell the amount of apples produced in this country. I understand that in this State statistics have been collected and that the marketable crop amounts annually to something like a million dollars. It is safe to say that the marketable apple crop of the country is worth from twenty to forty million dollars. It then has

a commercial value, as well as wheat or corn which is exported. In some localities this crop is abundant in one year, in others the next, and it seems to me that statistics should be gathered so that the people may be informed of this. The same may be said in reference to our other fruit crops. As yet, no machinery has been organized for this purpose, but I believe that I shall be able to organize such machinery, to the great advantage of our pomological interests. I have always thought that horticulture should have a bureau in this department, with a pomological division, having one of the best pomologists of the country at its head; and, though I have not yet seen a way to establish such a thing legitimately, I am looking to the formation of a bureau which shall have in charge those great industries. We know of the mistakes that exist in the matter of nomenclature, and if we had a bureau where our fruits could be properly named and classified it would be of great advantage.

As many of you know, we called a meeting not long ago, of representatives of agricultural colleges, which was largely attended, and a connection was formed between the department and all the agricultural colleges of the country. I am anxious that these colleges and the various experiment stations shall be the experimental grounds of the department, where the various seeds and plants can be sent to be tested to ascertain what are best adapted to that locality, and from whence they can be distributed. Mr. Leo Weltz, of Ohio, is now in Russia collecting various plants and fruits for the department, to be tested to determine their adaptation to the northern part of this country. Prof. Budd and others urged upon me the importance of having this done, and we know the benefit derived from the obtaining of hardy fruits from that region by himself and Mr. Gibb. I am also making arrangements with the consuls of various nations to collect such fruits and plants as it may seem of advantage to introduce. I am in sympathy with you, and am working for your welfare, and I want your aid and co-operation in the work in which I am engaged.

In the matter of forestry, little has been done by past administrations—nothing of any practical value. I am trying to get that machinery at work because we all know how our timber is being devastated. I am putting men at work who, I think, will do something practical. I have gathered for our agricultural colleges and experiment stations and for our arboretum, various trees and seeds, to determine their adaptation to different sections of the country, and I expect great good will come from it.

Now, in conclusion, I would again solicit your aid in this work. You have no idea of the weight of responsibility that I feel resting upon me. I am anxious to do all I can, but I am powerless to do it unless I have your sympathy, aid and co-operation. And I wish to assure you that I want your suggestions. I want you to write me freely, and I can say that any advice you give will be received as from a brother. Thanking you for your attention, I will not occupy your time any longer.

At the close of Commissioner Colman's remarks, W. J. Beal of the Agricultural College, Michigan, offered the following resolution, which was unanimously adopted:

Resolved, That this Society heartily commends the action of Commissioner Colman, of the United States Department of Agriculture, in the appointment of a person to investigate the diseases of plants, and desires to assure him of continued support in his efforts to develop this new line of work in the department.

The general subject of Grapes was next taken up.

Papers were read by T. V. Munson, of Texas, and Geo. W. Campbell, of Ohio, which were followed by general discussion upon

AMERICAN GRAPES.

The chairman, Patrick Barry, then presented the following list of grapes for discussion:

WYOMING RED.

H. L. Lyman, Va.: I have grown it five years. It is of excellent quality, foliage good; ripens its wood well.

C. A. Green, New York: It has handsome clusters resembling Delaware, but deeper red in color. It is of poor quality.

P. Barry, New York: It is of poor quality.

T. S. Hubbard, New York: It is one of the earliest red grapes, poor in quality and foxy, still I think most people would call it about as good as Concord. It is valuable for an early red grape, a healthy grower, and planted in several places in our State in vineyards. At Ann Arbor, Mich., it was doing well where Concords were rotting.

Geo. W. Campbell, Ohio: I have not fruited it much. It is of a handsome red color, very foxy, and not of best quality. Its foliage mildewed a little this unfavorable season.

NIAGARA.

Samuel Hape, Ga.: Its foliage is healthy. I have not fruited it.

W. Phillips, Mich.: Out of forty varieties it is the strongest grower and most abundant bearer I have. Have fruited it six years. By the first of August, this year, it had grown sixteen feet. It is well adapted to the sandy soil of our lake shore.

H. H. Hayes, Mich.: Have fruited it one year. It sells well, ripens well, keeps well, is a good grower, and is not troubled with rot or mildew.

H. L. Lyman, Va.: It rots in some seasons, in Virginia.

J. B. Rogers, New Jersey: The Niagara, as to health, is about on a par with Concord.

J. S. Collins, New Jersey: It rots and mildews some—this year it is better. It brings good prices.

P. Barry, New York: We fruited it last year. It is healthy in foliage and fruit. This year, it ripens late.

E. Graham, Michigan: Have grown it five years. It is healthy and as hardy as Concord.

T. S. Hubbard, New York: It is a strong grower, very productive and successful in our State; but we don't have much rot and mildew. In some places I am told that it rots as much as Concord. I would not advise planting it where Concord always rots.

EMPIRE STATE.

P. Barry, New York: I saw the grape before it was out of the hands of the originator. It promises well.

C. A. Green, New York: I saw a vine of it on the Hudson, which was healthy and promising.

J. B. Rogers: It is promising in New Jersey.

P. M. Augur, Connecticut: It is a beautiful grower.

Robert Manning, Massachusetts: It grows well.

Geo. W. Campbell, Ohio: Have fruited it this year, for the first time. It was not ripe when I left home. From testing it on exhibition, I think it good in quality, and not foxy. It has extremely healthy foliage, resists mildew, ripens its wood well, and I think is hardy.

POUHKEEPSIE RED.

Sylvester Johnson, Indiana: It is one of Mr. Caywood's seedlings. It rotted with me some this year, but it is an excellent grape, resembling the Delaware in appearance and quality, but is somewhat larger.

ULSTER PROLIFIC.

P. Barry, New York: It is by the same originator.

Sylvester Johnson, Indiana: It is one of the best grapes I ever grew; is a good grower, but its foliage is not of the best, and it has rotted some. Cannot say as to hardness.

F. M. Hexamer, New York: I have seen both of these varieties on Mr. Caywood's place, and they are there, perfectly healthy and of excellent quality.

P. Barry, New York: It is a large red grape with bunches of medium size.

Mr. Caywood, New York: I have known it eighteen years and have never seen a trace of mildew or blight on it. It is a moderate grower and holds its foliage until frost.

FRANCIS B. HAYES.

B. G. Smith, Massachusetts: I have been familiar with it eleven years. It has been exhibited at the Massachusetts Horticultural Society, always receiving honorable mention. It was exhibited before the American Pomological Society in 1879 and 1881. In 1879 the Report calls it a "white grape of excellent quality;" in 1881 of "fine quality and promises to be of much value." It originated with John B. Moore, of Concord, Mass.; is of medium size, excellent flavor, early, and perfectly hardy; ripens a week before Concord. I have seen it growing in Mr. Moore's vineyard by the hundred with no mildew.

Robert Manning, Massachusetts: I saw tons of them in Mr. Moore's vineyard last week. The vine is not quite as vigorous as Concord. Last year the vines in nursery rows, mildewed.

Geo. W. Campbell, Ohio: It grows about as vigorous as Martha, with foliage of the Concord character.

JESSICA.

P. Barry, New York: Has any one had experience with this grape, sent out from St. Catharines, Ont.?

No one answered.

CENTENNIAL.

T. S. Hubbard, N. Y.: It originated with Mr. Marvin, of Watertown, and is said to be a small white grape with small clusters.

Geo. W. Campbell, Ohio: I fruited it last season. It has fair foliage, but killed to the ground last winter. It is pink when ripe, clusters and berries, medium.

W. K. Munson, Mich.: It makes a poor growth.

AMBER QUEEN.

T. S. Hubbard, N. Y.: It did well with me the first year, but for the last two years the clusters have been imperfect.

VICTORIA.

T. S. Hubbard: It is the best of Miner's seedlings; better than Martha, and larger.

J. S. Woodward, N. Y.: It is a white grape, about the size of Concord, ripening a little before it, and of as good quality. Have never seen any sign of rot or mildew.

J. B. Rogers, N. J.: I think Mr. Woodward must have the Miner instead of the Victoria.

T. S. Hubbard, N. Y.: The quality of Victoria is about that of Concord.

Geo. W. Campbell, of Ohio: There has been some discussion, and some doubt, as to which of Mr. Miner's many seedling belongs the name of Victoria

—and it is probable that since his death they have become mixed, and that others of his grapes are being grown as Victoria, besides the one originally so named. He had several white grapes of similar character, and in flavor, all somewhat resembled the Lady grape. The Victoria, as I have seen it is a little smaller than Concord, white or light green, with handsome, well formed clusters, generally shouldered; foliage like Martha or Lady.

TRIUMPH.

T. S. Hubbard, N. Y.: It is too late for the North.

T. V. Munson, Texas: We have fruited it nine years. We obtained it from Samuel Miller, who discovered its good qualities for the South. It has rotted a little this year, but not heretofore. It is large in cluster, medium to large in berry. It is golden in color when fully ripe (green, probably, in the North), contains but one to three seeds, and melts perfectly in the mouth. It is a vigorous grower, inclined to overbear, and apt to shrivel if it bears too heavily. It is the best of the hybrids which I grow. Ripens late, about with Catawba. Its quality is fine with me, and not insipid as it is said to be at the North.

Samuel Hape, Ga.: It does well in my State; is showy, vigorous, and of good quality.

G. W. Campbell, Ohio: The Triumph originated with me, at Delaware, but is too late to ripen in Central Ohio.

ELDORADO.

P. M. Augur, Ct.: It rots with me this year.

T. S. Hubbard, N. Y.: Not worthy of cultivation.

Geo. W. Campbell, Ohio: It has imperfect blossoms and often sets poorly; mildews also, and is tender, in severe winters.

HIGHLAND.

C. A. Uber, Va.: It has a fine bunch, but rots.

H. L. Lyman, Va.: It is late, vigorous, with large clusters.

P. M. Augur, Ct.: It is too late.

Geo. W. Campbell, Ohio: It is too late, but is one of the largest varieties I have.

VERGENNES.

C. A. Green, N. Y.: I think well of it. It is a good grower, of fair quality, good foliage, and bunches not very large.

J. B. Rogers, N. J.: It is very subject to mildew and rot.

T. S. Hubbard, N. Y.: I think highly of it. It is healthy, except in unfavorable places; inclined to overbear, with good sized berries and medium clusters, good quality, extra good keeper, and a good grower.

J. J. Harrison, Ohio: We never have had any rot or mildew on the lake shore.

C. L. Hoag, N. Y.: It produces an immense quantity of fruit.

H. L. Lyman, Va.: It grows well and fruits well, in Virginia. Its foliage and wood are good, and ripen well.

P. M. Augur, Ct.: It is a strong grower with us and very productive. It mildews this year, a little. Have kept it until March.

Mr. Hendricks, N. Y.: It does well on the Hudson.

T. S. Hubbard, N. Y.: It ripens with Concord, and not as early as represented.

P. M. Augur, Ct.: It killed last winter with me.

T. V. Munson, Texas: It originated in Vermont with W. E. Green; is vigorous, rots and mildews some, clusters and berry medium in size, red color, skin thin but firm, quality good to best.

G. W. Campbell, Ohio: A good grower, berries rather large, clusters medium; good quality; mildewed slightly this year. Quite promising among the new kinds.

EARLY VICTOR.

T. S. Hubbard, N. Y.: A strong grower, healthy, with medium sized clusters and berries; much better than Concord, ripens a little sooner; has no mildew or rot with us.

C. A. Uber, Va.: Has no mildew or rot, and is earlier than Concord.

J. B. Rogers, N. J.: Ripens about with the Concord, better in flavor, perfectly healthy, bunch of good size, and an abundant bearer.

P. M. Augur, Ct.: Have fruited it three years. It ripens a week before Concord.

J. S. Collins, N. J.: It is healthy, a fine bearer, and a week before Concord.

Geo. W. Campbell, Ohio: It is healthy—have seen neither mildew or rot. It is promising for an early market grape. Ripens a week before Concord, but not as early as Hartford Prolific.

T. V. Munson, Texas: Have fruited it two years. In both seasons it rotted severely in what we call the black or first rot. The second or gray rot that is so destructive to Concord does not attack it. It ripens with Ives, but has better pulp; is very vigorous and productive, but not profitable on account of rot.

JEFFERSON.

P. M. Augur, Connecticut: Had it three years; it is tender.

C. A. Green, New York: It is two weeks later than Concord.

T. S. Hubbard, New York: It is as late as Catawba, grows well, and has good foliage, and we think quite favorably of it.

J. S. Woodward, New York: It is too late.

H. L. Lyman, Virginia: Have grown it two years. It requires a good deal of care; will give good fruit with bags, and is a valuable late variety.

B. G. Smith, Massachusetts: I have had good success with it near Boston, but it is tender.

G. W. Campbell, Ohio: At Delaware, the Jefferson is earlier than the Catawba, and though rather late, ripens well. It is a good, healthy vine, with strong and abundant foliage, not liable to mildew. It is not hardy in severe winters, but is easily protected. It is about as hardy as Brighton; bears large and handsome clusters, and to my taste is a better grape.

MOORE'S EARLY.

J. L. Budd, Iowa: Few of the grapes mentioned do well in our State, but we obtained some of the first vines of Moore sent out, and they are very promising. It is hardier than Concord, the reason, I think, being that it has a better leaf. It is a bad season for the foliage this year, and the Concord is much injured, but the Moore is not. The fruit was looking fine when I left home. It is much earlier than Worden, and quite as productive.

H. L. Lyman, Virginia: We have had it two years. It is satisfactory in wood and foliage, and an abundant bearer. It is ten days earlier than Concord, I shall plant largely of it.

J. C. Plumb, Wisconsin: I endorse what Prof. Budd has said. It is one of the most promising of the new, early grape sfor our State. At our State Fair, this week, I examined critically the grapes on exhibition, and found Moore full a week ahead of Worden, and with better clusters.

J. B. Rogers, New Jersey: It stands as well as any grape for the market and family.

E. H. Scott, Michigan: Have had it three years, and it has done well until this year, when it rots.

T. V. Munson, Texas: It has no anthrax, some rot, and no mildew. It is very early, ripening just after Champion; color, black; skin, firm; size, medium, to large; quality, good, to very good.

J. J. Harrison, Ohio: It ripens soon after Champion, and does not rot.

C. A. Green, New York: It ripens before Worden; we think a great deal of it.

Robert Manning, Massachusetts: I was at Mr. Moore's vineyard, the other day, and it is doing even better than ever before; on exhibition before the Massachusetts Horticultural Society, Boston, August 29, it received the first prize as the best early grape. It is hardy and free from mildew—hardier than Concord, and ripening two to three weeks before it.

LADY WASHINGTON.

P. M. Augur, Connecticut: Too late.

C. A. Uber, Virginia: It rots.

Samuel Hape, Georgia: It has succeeded with me this year.

H. L. Lyman, Virginia: Have fruited it two years successfully. It has shown no rot; the bunches are large and very perfect, and it brings a high price. The foliage is good.

C. A. Green, New York: It is too late, but otherwise desirable.

T. S. Hubbard, New York: It is too late; the fruit mildews and the vine becomes feeble after a few years.

PRENTISS.

T. T. Lyon, Michigan: It is too tender.

E. H. Scott, Michigan: Have had it four or five years and have not had a berry. It kills down.

T. S. Hubbard, New York: I sent it out, but it does not succeed except in favorable localities.

T. V. Munson, Texas: Weak in growth, tender with regard to drought, rots and mildews some; clusters, medium, white; skin, firm; quality, fine; early.

P. M. Augur, Connecticut: I had a very fine crop last year. This year, it mildews. It is tender.

G. W. Campbell, Ohio: Prentiss has disappointed nearly all who have planted it.

WORDEN.

H. L. Lyman, Virginia: Have fruited it two years. It is a few days later than Moore, and we prefer the latter; still it is good.

Samuel Hape, Georgia: It does splendidly in our locality.

G. W. Campbell, Ohio: It gives satisfaction wherever I have seen it. It is a week or ten days earlier than Concord, and evidently a seedling from it. It seems to have all the good qualities of Concord, and also most of its faults. Has a very tender skin, easily broken; and it is not a very good keeper.

P. M. Augur, Connecticut: We have it side by side with Concord and like it better. It is three or four days earlier.

T. S. Hubbard, New York: It is looking well at the vineyards of Munson & Knapp, near this city. They think it seven to ten days earlier than Concord. They have contracted their crop of an acre at eight cents, and their Concords at four and a half cents. It seems to be giving good satisfaction. It is earlier than Concord, larger, of better quality, and equal to it in health and hardiness.

Jacob Ganzhorn, Michigan: Is it less liable to rot?

T. T. Lyon, Michigan: Yes. There is no rot in my Wordens, and there is in the Concords.

W. K. Munson, Michigan: I have had it ten years. It is from eight to fifteen days earlier than Concord, a stronger grower, with larger and thicker leaves. It is as good a bearer and as hardy. It is the best black grape we have. My vineyard is a sandy loam with clay subsoil. There is no rot on any of my vines.

J. L. Budd, Iowa: I commenced growing it eighteen years ago, and talked about it, and tried to get Western men to grow it; but people at the East discouraged it. They called it the same as Concord, so that until within five or six years, we have not grown it much at the West. But, unless we except Moore, it is the best black grape we have at the West. It seems to have everything in its favor. It ripens seven to ten days before Concord.

J. S. Woodward, New York: It is not as good quality as Concord. We are liable to make a mistake in comparing their quality, because at the time of comparison the Worden is apt to be ripest. It is more foxy than Concord, and not as rich and sweet.

On motion, a committee, consisting of T. V. Munson, of Texas, P. M. Augur, of Connecticut, and C. A. Uber, of Virginia, were appointed by the Chair to visit the vineyard of Messrs. Munson & Knapp, near the city, and report at the afternoon session upon the comparative merit of the Worden and other grapes there grown.

About fifty gentlemen visited, upon invitation, the vineyards mentioned, and a report was made toward the close of the afternoon session, that it was hard to decide which appeared best under the same circumstances, Worden or Concord; but there seemed a slight preference, in favor of Worden.

DUCHESS.

C. A. Green, New York: It is one of the finest, but tender. It has large clusters, of fine quality.

T. T. Lyon, Michigan: The vine fails in many locations.

H. L. Lyman, Virginia: It requires careful pruning to ripen its wood with us. It is subject to rot.

POCKLINGTON.

E. H. Scott and Peter Collier, Michigan: It rots.

T. V. Munson, Texas: It is vigorous and hardy South; is subject to rot, but not mildew; clusters, medium to large, yellow; skin, tender; pulp, tough; quality, fair, but musky.

Mr. Caywood, New York: It drops quite badly and is of poor quality.

C. A. Uber, Virginia: Vigorous, but rots.

G. W. Campbell, of Ohio: It neither mildews nor rots, at Delaware. Is a healthy vine, very productive of large, handsome clusters, of fair quality; a week later than Concord.

WOODRUFF RED.

T. T. Lyon, Michigan: It was shown at the Boston meeting four years ago. It is not yet ripe. I think it a valuable market variety, both on account of the vine and fruit. It is of fair quality.

E. H. Scott, Michigan: It does well in our locality, and, though it is being widely tried, I have received no reports against it, as regards foliage or vigor of growth. I have not known it to mildew.

C. A. Green, New York: It succeeds almost anywhere. It has a large bunch and berry, and is very attractive.

Jacob Ganzhorn, Michigan: Have fruited it four years, and had a good crop every year. It is perfectly hardy, as productive as Concord, and ripens about with it.

T. S. Hubbard, New York: It is a strong grower, and looks like the New England Fox grape in foliage and growth of vine. The canes have little prickles.

J. S. Woodward, New York: It grows healthy and strong. As I saw it at Ann Arbor, Michigan, it was of fine appearance and fair quality; more pulpy than Concord. I think it will make a good market grape.

EATON.

B. G. Smith, Massachusetts: It has been exhibited several times at the Massachusetts Horticultural Society, and seems promising. It is not generally disseminated yet. It has also been exhibited before this society. The bunches are large, and the berries sometimes an inch in diameter.

Robert Manning, Massachusetts: It is an excellent black grape—large, showy, and of good quality; equal to Concord.

This closed the discussion upon fruits, and the foregoing report embraces the most important part of the proceedings of general interest to the public. Some interesting papers were read, for which we have not room even for extracts. One by L. B. Pierce, of Ohio, giving his ideas as to the manner in which Horticultural Societies should be conducted, was well received.

Reports from several States were made, but nothing specially new or valuable was elicited.

The following reports were also made, by W. J. Green, of the Ohio State University, and A. G. Babcox, of Plymouth, Ohio:

REPORT ON THE FRUIT EXHIBIT OF THE AMERICAN POMOLOGICAL SOCIETY, HELD AT GRAND RAPIDS, MICHIGAN, SEPT. 10, 11, 12, 1885.

BY W. J. GREEN, O. S. U., COLUMBUS.

The display of fruit at this meeting, was said to be the finest ever held under the auspices of the Society, there being about 1,600 plates of fruit on exhibition, mostly of very fine quality. The location, doubtless, contributed largely to the result, Michigan being one of the best fruit-growing States in the Union. About half the fruit shown, was from this State.

The other States represented, were Missouri, New York, Pennsylvania, Massachusetts, Minnesota, New Jersey, Florida, Georgia, California, Texas, Indiana, Illinois, Wisconsin, Maryland, and Ohio.

The Michigan display consisted of 547 plates of apples, 21 plates of crab-apples, 152 plates of pears, 68 plates of plums, 34 plates of peaches, 69 plates of grapes, 4 plates of raspberries, and 4 plates of blackberries, making 838 plates in all. There were, of course, in this collection, many duplicates, as it was the combined exhibit of county horticultural societies throughout the State. It was, in fact, for Michigan, what the whole exhibit was for the United States.

The Missouri State Horticultural Society made a fine show, with 211 plates of fruit, consisting of 146 plates of apples, 42 of pears, 20 of grapes, and 3 of peaches. The

apples, especially, were very fine and attracted much attention. In this collection, were several seedlings that are thought to be very promising.

The Ohio exhibit, which occupied one large table, was the occasion of many favorable remarks. All the fruit sent was found to be in good condition, on arrival, except the grapes, but only a few plates of these were unfit for exhibition. There were 104 plates in all, consisting of 24 of apples, 24 of pears, and 56 of grapes. In grapes, Ohio ranked next to Michigan, having only 13 plates less, and about one-fourth of the whole number on exhibition. Much credit is due the committee who made the selections from the fruit on exhibition at the State Fair, for their care in selecting specimens and in packing.

Peter M. Gideon made an instructive display of seedling apples and crab-apples of his own origination. The Excelsior, Martha and October, he considers very valuable varieties.

A display of cocoanuts from Florida attracted much attention, and were a source of wonder to those who were told that the seventeen nuts originally grew upon a single fruit stalk, lying upon the table.

A fine opportunity to study varieties of pears was presented in the collections of Marshall P. Wilder, which numbered 100 plates, that of Ellwanger & Barry, of 140 plates, and Benjamin G. Smith, of 61 plates. To all of the above mentioned societies and individuals, Wilder silver medals were awarded.

H. M. Engle & Son, of Marietta, Pa., made a good showing, with 28 plates of pears, 27 of grapes, 3 of peaches, and 2 of apples. They also had on exhibition a variety of chestnut called the Great American, which was of unusually large size, and is said to be worthy of propagation. A. J. Caywood & Son, of Marlboro, N. Y., made a fine display of Poughkeepsie Red, Ulster Prolific and Black Delaware grapes, originated by themselves. W. W. Thompson, Smithville, Georgia, exhibited an interesting collection, consisting of pears, grapes, figs, Japanese Persimmons and Pomegranates. A. Block, of Santa Clara, California, had on exhibition four varieties of seedling pears. Professor Bailey, of the Michigan Agricultural College, made an interesting and instructive exhibit that was somewhat out of the usual order. It consisted of 100 samples of wild fruits, native of Michigan, and included, among others, four species of wild grapes, two of plums, three of huckleberries, three of cranberries, two of haws, and eight of various kinds of nuts. This collection was especially interesting from an economic point of view, because of the available material for future development, which it contained. T. V. Munson, of Denison, Texas, had 12 varieties of native grapes, 5 of peaches, and 12 of apples, also several varieties of plums. To the above named collections, bronze medals were awarded.

There were also many new varieties of more or less promise shown, but it is not possible to judge as to their merits from the fruit alone. An exhibit of cranberries, said to be of a new variety of superior merit, attracted much attention. The much talked of Comet pear, was shown by J. S. Collins. In appearance, it is all that can be desired, but opinions are somewhat divided as to its quality, the majority placing it quite low. That it is a profitable variety for early market, seems to be generally conceded, and it will doubtless be widely disseminated. The Empire State and Niagara grapes were objects of much attention, as fine samples of each were on exhibition. The Niagara seemed to be popular with those who had fruited it. Several plates of apples, that had been kept two years in cold storage, were objects of curiosity. There were specimens of mangoes, alligator pears, oranges, plums and a number of other fruits, about which but little of general interest could be learned.

The exhibit, on the whole, was conspicuous for its merits as a general display, the only noticeable scarcity being that of peaches. There was, apparently, but little of an objectionable feature sometimes seen, that of exhibitors advertising their wares, to the exclusion of other important matters. The success of the exhibition was largely due to the courtesy of the members of the Michigan Horticultural Society, and the members of the Ohio delegation have special cause to feel grateful for the many kindly attentions shown them.

AMERICAN POMOLOGICAL SOCIETY AT GRAND RAPIDS.

REPORT BY ARTHUR G. BABCOX, OF PLYMOUTH.

The exhibition of fruit at the American Pomological meeting at Grand Rapids was almost beyond description. Knowing that my fellow delegates would look after new varieties and new methods, I looked about for some one who had really battled with some of the enemies of fruit-culture, and in the face of all, had some success. I at

last found an elegant display of plums, Bradshaw's, Egg, Gen. Hand, Washington, Pond's Seedling, and English Pond's Seedling, German Prune, Coe's Golden Drop, Green Gage, Jefferson, Smith's Orleans, and Lombard. I found the grower to be Judge J. G. Ramsdell, of Traverse City, Mich., who cheerfully gave me the following facts: "I have 300 plum trees, 15 years old. Best kinds, I think, are, for early, Washington; medium, Coe's Golden Drop; late, English Pond's Seedling. Bradshaw, very large and prolific; with Lombard surest and most profitable. The English Pond's Seedling is better than American Pond's Seedling; with the Victoria as a new variety, very promising." He said: "The curculio thins the fruit, (and I might remark just here, they will make it very thin, indeed, if not properly looked after), but we do not try to catch them in the night, or very early in the morning, or in the evening, or when the dew is on; but during nice warm weather, when they are at work, we shake them on a sheet and destroy them. The plum will over-bear, and the best method of thinning is pruning. I lost my orchard by permitting it to over-bear three years in succession. Salt and ashes as fertilizers are very good."

The one hundred varieties of pears, from President Wilder, of Boston, was a grand sight, and one could hardly help thinking of the countless number of unknown and undiscovered varieties of all kinds of fruit waiting to be developed through the channel of hybridization. Just think for a moment of the chance seedlings accidentally discovered, and think of their value! As I gazed upon the great display of fruit, I wondered why it was that Ohio produced so many wonderful men, and so few, comparatively, who are a benefit to our fruit interests. The meeting at Grand Rapids was very instructive. I could not help but notice this important lesson: He or she who studies horticulture elevate themselves, and soon become similar to a tree, vine, or plant. As you try to aid these to grow perfect fruit and flowers, you find yourself seeking to improve your own self. Dr. Hexamer said, "that because somebody said hybridization did not produce certain results, did not make it so. Some scientific men proved to other scientific men that a train of cars could not be run through a tunnel, but you know that they were mistaken." To me this was a valuable lesson. Because some one crossed the Crescent strawberry with the Sharpless, and the result did not produce a berry as large as the Sharpless, as firm as the Wilson, and as productive as the Crescent, is no positive evidence it cannot be done. What the horticultural world needs to-day is more earnest workers, who are willing to make a sacrifice to obtain new varieties, and with the mystic key of hybridization unlock the fetters that hide them from our anxious view.

To me the idea of using poison to kill insects on fruit trees and vines was very interesting. Mr. Moody, of Lockport, N. Y., and others have been very successful spraying their trees. One pound of London Purple to 200 gallons of water, I think, is the proportion. Mr. Moody draws a tank on a wagon through his orchard and pumps the poisoned water onto the tree while in blossom and shortly after. And the fact is, the insects do not like this preparation. I firmly believe it will pay any fruit-grower to try this. The pear blight was ably discussed by Prof. Arthur, of Geneva, N. Y. From actual experiment, he found living germs in the pear sap, which caused the blight, but did not give us a remedy to destroy the germs. Advised slow, well-ripened growth.

The fruit exhibited at Grand Rapids from Ohio attracted much attention and many favorable remarks, and was much used as a comparison with Michigan fruit, and was awarded a Wilder silver medal.

John Poste, W. W. Farnsworth, Daniel Duer, Z. T. Duer, Jacob Linxweiler, and H. G. Tryon, are the men who should have the honor of preparing the fruit to go to Grand Rapids. It cost some faithful work which was cheerfully performed.

Knowing that other extensive reports of the meeting are to be made, I will not occupy any more time, but will close with this request. The Ohio State Horticultural Society are in want of one hundred young members. We most certainly do need them; and during the next year let each of us try and get some one to join with us. If Leo Weltz can get members living in Europe to join, certainly we ought to be able to obtain many here. Many will say, How can we induce some good young people to join? The actual building of a botanical garden, would be a grand help. I think it was well built on paper, last evening. It did seem as if I could smell the flowers, see the lovely walks and drives, hear the water rippling over some of the falls; and I almost saw General Hurst standing among his admirers in this garden, saying "What a grand place this is!"

This garden should, and must really be. It has commenced to grow, and may it ever live to bless, and cheer, and aid us all.

HISTORY OF AN OLD PEAR FAMILIAR TO CINCINNATI PEOPLE.

BY GEO. W. TROWBRIDGE, OF GLENDALE.

CRAIG PEAR.

The following are synonyms: *Early Butter*, of Indiana, (see Hooper's Western Fruit Book, page 154); *Hatch's Early*, of the Cincinnati Horticultural Society; *Stanford Pear*; *Sanborn Pear*; *Hastie's Early*; *Wright Pear*.



CRAIG PEAR.

Tree, upright, spreading in growth, rather tardy coming into bearing, but regular and abundant with increasing age. Young shoots, yellowish or olive-green, with oblong white specks. Fruit small, and in shape roundish or ovate acute pyriform. Skin smooth, and thickly sprinkled with minute dots, rarely blushed, and when ripe lemon-yellow in color, does not rot at core but should be house-ripened. Stem one inch or over in length and usually curved, set without depression, and a little thickened at base. Calyx open and set in a very slight or no depression. Season first to tenth July.

The Cincinnati market has been supplied, for forty or more years, with a rich, lemon-colored, sweet, half-buttery and half-melting, early pear, under medium size, which has always sold well, especially to those having fruit-stores and stands; and which made it the most profitable very early variety, whose season of perfection is from the first to the tenth of July. Of all the pomological authorities, Hooper, as cited above, is the only one where I could find any mention of it, and there no information as to its origin or precise location. I have been endeavoring, for several years, to straighten out its nomenclature and origin, having failed by the means of sending specimens to Downing, Barry, and Thomas. After learning, through Wm. E. Mears and Richard Stanford, that the fruit originally came from Indiana, near the town of Vevay, on the Ohio River, I visited that vicinity the latter part of June, this year (1885), and saw the original tree still standing, within less than one hundred yards of the edge of the Ohio river, at Craig's Landing, five miles below the town of Vevay. From Mr. John Wright, an old settler of that neighborhood, I ob-

tained the following history: About the year 1800, George Craig emigrated from Virginia, stopping first on the Kentucky side of the Ohio river, afterwards crossing and settling permanently on the north bank. Subsequently, when Indiana was made a territory, he was appointed a member of the Territorial Legislature. In 1804, he made a journey on horseback to Vincennes, in pursuance of his duties as a legislator. He was there presented with several small seedling pear-trees, which he carefully brought home in his saddle-bags, and as carefully planted out, having an especial taste for growing fruits and caring for the trees. This seems to have been the only one which survived to make its mark now, eighty or more years old; and there it stands, a good monument of size, vigor, health, and productiveness. I measured the circumference at a height of four feet from the ground, finding it to be nine feet four inches. Upon inquiry as to the height and spread of branches, I was told the former was forty-eight feet, and the latter forty four feet, previous to some injury by a severe gale of wind some years since. No fire-blight whatever has been seen upon the tree, or any of its branches; neither upon any of the trees which have been propagated from it, either in that vicinity or around Cincinnati, and I know of, and have seen many. In one season, the tree produced fourteen barrels of marketable fruit, as Mr. Wright states, he attended to the picking and shipping in person, while Mr. Stanford states, he received and sold them. On heavy, clay soils, the tree is not a rapid grower, or early and abundant bearer; but its home and adaptation seems to be on rich, alluvial soils, where the roots can penetrate deeply, and at the same time find abundant warmth and moisture. There it is a success, and no variety of the same season with which I am acquainted, can compete with, or excel it, in the aggregate qualities essential to make a generally successful and profitable fruit. I may as well say, the season of Doyenne D'Ete is almost, if not identical with it, but cannot compare with it or compete in health, hardness, or longevity of tree. I am growing both, and speak from both experience and observation. The variety should be better known and more generally cultivated. John Lamson is the present owner of the farm on which the original tree now stands.

The following instructive essay was read, by the author, before the Stark County Horticultural Society, at the December meeting, 1885:

THE ORIGIN AND PRESERVATION OF SOILS.

BY G. W. DEAN, OF KENT.

It will be remembered that this was in part the subject of Mr. Powell's essay at the September meeting. He went back a long ways to get a good start, and came up gracefully to the starting point, but seemed rather timid about grappling with a theme of such extreme intricacy, and hedged about with such a foggy atmosphere of the unknown.

My vision is no keener and my means of knowledge no greater. I fear that the most I can do is to play the little dog, and run around and bark. His lucid and panoramic description of the nebular hypothesis was very interesting, his ideas of the mechanical formation of the soils entirely satisfactory, but the result of simple wearing or grinding away of primitive or ingeous rocks forms a very lean soil, to say the least.

It seems probable to me that at one stage of the earth's existence there was mixed in the atmosphere an immense amount of hydrogen gas, and vastly more of oxygen than at present, and that when the required condition of temperature was reached, the hydrogen combined with part of the oxygen and formed the waters, and the whole earth probably became one vast ocean. This primeval ocean was the birth place of the first thing that had life, vegetable or animal. In the death and decay of that first of all living things, whatever they were, began the increase of fertility of whatever soil there was, and this was the beginning of the preparation for the advent of man, and was continued through the countless years of succeeding ages. Each succeeding age was an improvement upon the one before it; its conditions of soil and atmospheric purity made it capable of producing and sustaining higher forms of life.

In the whole Laurentian period, the oldest known sedimentary rocks, nearly 30,000 feet in thickness, there has been found no positive evidence of life. One or two doubtful forms are known; the principal one, and best known is the *Eozoon*

Canadense, or dawn of life of Dawson. It was first recognized as a probable fossil, or preserved relic of a low form of life, from its resemblance to the *Stromatopora*, a well-known fossil coral from the Lower Silurian.

Doubtless, many low forms of life existed at this time; but the rocks are so bent and twisted and melted out of their natural condition, that these forms, if they ever existed, have been obliterated. These rocks, which are called metamorphic rocks, contain vast beds of *graphite*, equal in quantity, it is thought, to the coal of the carboniferous period. As *graphite* is nearly pure carbon, geologists are puzzled to account for its existence in such masses, except upon the theory of a vegetable origin like the coal.

These rocks also contain extensive beds of *apatite*. This mineral, when pure, is over ninety per cent. phosphate of lime, and is being extensively quarried, treated with sulphuric acid, and sold as a fertilizer. Some believe it to be of animal origin, on account of its similarity in composition to the marls of North and South Carolina, which are known to be of animal origin.

My ideas of the subject require me to follow up the development of the progress of animal life from these low forms through the principal geological divisions, making brief mention of the highest known forms in each. These aqueous, stratified, or fossiliferous rocks, laid down in the beds of the oceans and lakes, and carried down by the rivers, and washed up by the tides, aggregate nearly one hundred thousand feet in thickness; and there is now no confusion among geologists as to the relative position of each strata. For instance, when found together, the Carboniferous always rests upon the Devonian, and never the Devonian upon the Carboniferous. This proves, beyond question, that the Devonian is the older formation of the two. And I believe, without exception, each subsequent division shows a higher form of life than the one before it; one grand step upward, pointing in the direction of the most perfect of all known forms.

All through the Cambrian, Lower Silurian, and a part of the Upper Silurian, life was abundant in the waters. Species almost innumerable lived, and many of them died out and were succeeded by others, building up their new lives upon the remains of the dead; but the highest among them was the *Trilobite*. He was the lordly one, the noblest being then living, and this because the soil, or, more properly, soul of the earth, which was probably then all sea bottom, was fitted for that kind of life, and not for higher forms. This brings us more than half way through the sedimentary rocks, and through a lapse of time of which we had better not speak, for no mere human mind will ever know or realize its vastness, and the most noble animal yet produced had probably no higher organization than a centipede or a sow-bug. In the Upper Silurian appears the first fish; a very low form, of which there is no living type, the nearest probably being the Australian mudfish. These little forms, having no true bones, had their heads protected by a shell or, as it is called, a shield. They are proved to be the remains of fish by scales attached, I believe, to a single specimen. You all probably know that the hard part of an animal is all that is preserved. I will say, in passing, that Prof. E. W. Claypole, of Buchtel College, is the discoverer of the oldest fossil fishes in the world now known, and of the oldest fossil tree, *Glyptodendron Eatonense*.

Later, in the Devonian, we have the great group of ganoid fishes, with gristly or cartilaginous vertebrae, of which we have a surviving representative in the voracious Garpike of our western rivers.

It is thought probable, by Prof. Newberry and others, that this group branched out in the Carboniferous on the one hand, into the true bony fishes; and on the other, into the amphibians called *Labyrinthodonts*, many of which retain their gills through life, showing their fish ancestry. These first of land animals, as far as known, with the exception of a few scorpions, were able to breathe the pestilential air of that period, with its burden of carbonic acid, which man could not have lived in.

And so the progress goes on. Passing the Permian, in the Triassic we find the first mammal, about as low in organization as a mammal could well be—a sort of Kangaroo rat. In the Jurassic and Cretaceous, the mammals seem to have made little progress, a marsupial, slightly resembling our opossum, being the highest form; but the earth was filled with huge reptiles, gigantic Dinosaurs browsing from the tall trees, hideous flying dragons, and birds with teeth and a lizard's tail.

In the Eocene, or early Tertiary, came the Orophippus, a horse the size of a fox, with four toes, all hooved and touching the ground, and many other forms resembling those of the present day, including the monkeys.

In the Miocene and Pliocene many new and higher forms appear; and, lastly, in

the Post Pliocene, we find the undoubted works of man, a fierce savage, but still a man, with rude implements of stone battling with the ferocious animals of that period. The date of his appearance can never be known, and the estimates vary so much, that a guess is about all any of them amount to; but all who have carefully weighed the evidence place it very many thousand years back.

And man exists because the earth has become a fit habitation for him. Its conditions have become suitable for him; its soil has become fit for the production of food proper for his sustenance and high development and onward advancement.

A member of this Society once said to me, "Don't make your essays so perfect that there is no chance for argument. We want a chance to pitch in." Well, pitch in; there is a good chance this time. Remember, however, that I am not arguing from the events of a day, or a thousand years, but from the world's history as written in the rocks. My position is this: Organized matter for the purpose of building up new organizations is better than crude matter. In other words, one use better fits it for the next, and each succeeding use better adapts it for the next one. The question is simply this: Is matter susceptible of any change for the better by use—does the thousand or, perhaps, million times that most visible matter has passed through successive organizations better fit it, for instance, for the composition of the human brain and other delicate organs? Imagine a nervous system made up of atoms of carbon, oxygen, nitrogen, and hydrogen and a few minerals, all of which are cast from matter, from all eternity dead, never having felt a single throb from the living, and then, if you can, tell me that such material is just as capable as any other of working out the problems of Euclid.

If primitive matter was just as good material for mental organizations, it seems to have been very sparingly used. It seems to me, that if there had been just as good brain-material in early geological ages, there would have been a corresponding amount of brain, at least in animals of the same class. How is it in the early Tertiary or Eocene period? I have no doubt there was then approximately the same quantities of soil, made up of the same elementary constituents as the soil of to-day, if we consider only their chemical properties. Yet the mammals or milk-giving animals of that period had not more than one-tenth of the bulk of brain that the mammals of our day of the same size possess; and my impression is, that the inferiority in quality would be as marked, as in size.

I believe that things were made to move, and be made better by it; and that they do move, and, all things considered, in the right direction. There is a struggle, and right where this struggle ends, degeneration begins. The barnacle ceases its activity, settles down to a life of idleness, and its degradation is perpetuated. I cannot believe with the Rev. Sam. Jones, that things were begun wrong end first; that man was created an angel and degenerated into a monkey. If what he said has been correctly reported, it may be the best living proof of the truth of the text, "As a man thinketh so is he."

Let no one infer that I believe that man is the descendant of a monkey, for I do not. It forms no part of the theory of evolution. Darwin taught nothing of the kind. This world is not to become devastated; that is, not yet. It contains the elements of a future progress even more marvelous than that of the century now nearing its close.

This improvement will come where some of it is sadly needed. It will not always be that when men grow old and their boys have all been promoted to the position of brakemen on a freight train, or the management of a skating rink, that there will be a fringe of briars a rod wide on each side of their fences. The land will be too valuable for that kind of farming. I believe that cultivation goes hand in hand with civilization; that high quality of soil begets high quality of blood and mind and soul, and that of great things, greater may come.

"Great Cæsar, dead and turned to clay,
May grow another, better every way."

I believe that most farms in good condition may be kept so, and even grow better, and that without the purchase of phosphates or other expensive fertilizers. There is necessity, however, of great care in providing against waste. There is no denying that if all is taken off and nothing returned, any farm, however rich, will in time wear out, but I think much more can be taken off than is returned.

It has been shown by experiments, says an eminent authority, that the exhaustion of the soil can no longer be estimated by the constituents removed in the crop. In the Rothamstead experiments in England, a field in good condition, was sown half to barley and half to clover. The yield of nitrogen in the crop was thirty-seven

pounds in the barley and one hundred and fifty-one pounds in the clover, per acre. The next year, both plots were sown to barley, and, notwithstanding the removal of more than four times as much nitrogen in the clover the previous year, the clover-plot gave sixty-nine pounds, and that previously in barley, gave only thirty-nine pounds. Here was seventy-seven per cent. added to the productiveness of a soil simply by growing one crop of clover, all being removed except the roots and stubble. Now, I think that an experiment of this kind on my soil would show practically the same results, and that the plot upon which the clover had been grown first, would be left in much the better condition.

The question then arises, Whence this supply of nitrogen? The atmosphere is more than three-fourths nitrogen, by bulk or weight, but it is claimed to have been shown by Bousingault and others, that plants do not assimilate free nitrogen, and that their atmospheric supply is limited to the very small amount of combined nitrogen in the form of ammonia and nitric acid. If this is true, what a spectacle to contemplate. Here are full twelve pounds to the square inch of the best fertilizer covering the whole world, and absolutely unavailable for any practical use, except, as one author says, to dilute the oxygen of the atmosphere. Let us see: nitric acid, which the authorities admit is assimilated by plants, is nitrogen and oxygen combined; the air is nitrogen and oxygen free. Dana says, "The nitric acid of the cavern nitrates, comes from the atmosphere, but the combination takes place through the agency of a peculiar kind of microscopic plant." Stick a pin in here. Plants are powerful chemical agents. Every leaf is a perfect galvanic battery in full action. And their little rootlets are known to erode glass.

Go to any place where the ground has been shaded for a long time, and is not subject to drainage, and there is plenty of combined nitrogen, soluble in water and thus available for plant growth. Simply lay a wide board on the grass, and let it lie for a year; then sow your field to wheat, and you will see the shape of the board in the increased growth of the grain. Whatever the cause may be, it will not be denied that ground that is shaded by vegetation, or otherwise, preserves and increases its fertility, while soil without verdure or covering of any kind, soon becomes barren.

Admitting that the leaves of plants, as claimed, do not assimilate free nitrogen, how can it be said that the rootlets down in the soil do not by electrical action assist in the formation of the nitrogenous combinations, from the free nitrogen of the air in the soil? I think we may certainly think twice before we accept the conclusion that for plant use, free nitrogen must always remain free. Dana says that old plaster lixiviated gives five per cent. of nitrate of potash. I wait for the evidence that this is not drawn from that immense reservoir, the free nitrogen of the air. In a recent private letter from the director of the Ohio Experiment Station, he says: "There is no evidence that the ammonia or nitrogen in clover does not come largely from the atmosphere." The experimenters at Rothamstead have it, that the amount is very small, and not more than the loss by drainage. Another point established by these experimenters is, that in a succession of crops without manure, the nitrogen in the soil diminishes. This, I should think, might have been pre-supposed. It seems to me that no experiments were needed to make such a result certain. But Dr. Gilbert, one of the managers, goes on to say that, "so far as we are able to form a judgment on the point, the diminution is approximately equal to the amount of nitrogen taken out in the crops." Let us examine this statement in the light of another experiment made at Rothamstead. I will say first, however, that this statement is so inconsistent with the results of his experiment already given, that I am inclined to think that he did not intend to include in it clover and other leguminous plants. An annual average of nearly two hundred pounds of nitrogen per acre for twenty-seven years was obtained in the clover grown without manure, on a plot of old garden soil; but, as in other cases, there was a marked decline in the average yield of nitrogen during the latter part of that period, and there was also a great reduction of the stores of nitrogen contained in the soil. I should think so. Over five thousand pounds of ammonia or nitrogen per acre removed, and not one restored. It seems to me that the soil must have been immensely rich to have retained vigor enough to grow a Canada thistle. The weak points in these experiments are obvious. First, it is preposterous to grow clover, or any other crop, twenty-seven years in succession, and worse yet to grow any crop on any soil so long without manure, and any conclusions based upon such experiments are valueless to show that the soil received no benefit from the free nitrogen of the atmosphere. From what source, I ask, did the nitrogen from the first speck of soil come? The first handful sufficient to grow the first weak little plant, to give food to the first unindividualized little mass

of protoplasm. All animal and all vegetable life required it. It is not a constituent of the igneous rocks which were then being worn down by the waters. Where so natural, and so sure, and so easy a source as the forty miles or so thick of it, surrounding the earth and, in limited quantities penetrating the waters to the very bottom of the ocean.

"This clover plot," says Dr. Gilbert, "was exceptionally rich in nitrogen at the beginning." It must have been; and then he does not claim that it was by any means exhausted. Now, let us suppose that on this plot there had been grown a rotation of crops; say, first, clover; then corn, oats, and wheat; then clover again; and once in the four years, say between the oats and wheat, the land had received a dressing of stable manure containing four hundred pounds of ammonia or nitrogen, or one-half the average amount taken off for twenty-seven years, but nowhere near half the amount taken off the first four years. I say, suppose this; then does any one here believe the land would not have continued as good as at first? I have not a doubt of it myself. I have before my eyes every day a living proof of it. I can point you to a farm that has received much less, and constantly improved for twenty years. In a ton of the best bone, you get four to six per cent. ammonia—eighty to one hundred and twenty pounds. I would rather have an amount of stable manure that would contain one hundred and twenty pounds of ammonia than a ton of the best ground bone ever sold, and you would at least have to apply three tons to equal the amount I have supposed.

Average stable manure contains nine pounds of nitrogen per ton. This gives only thirteen tons of manure, but I would get one hundred and thirty-five pounds of potash, in which my soil is deficient. I should also get a large amount of vegetable matter of great value, aside from the chemicals they contain.

We hear a good deal of late about clover not adding really to the fertility of the soil upon which it is grown; that its only use is to bring to the surface nitrogen and other fertilizing agents already in the soil, thus making them available at once, which they would not otherwise be, and that its continued use will wear out and exhaust the land. While I admit that mismanagement and neglect may accomplish a good deal in the way of impoverishing soils, still I am in no degree frightened by this bug-bear. Soils, from some cause, I am told, have become what is termed clover-sick; that is, it becomes difficult to get a good catch upon them; but such soils are in no sense exhausted. They are simply in a state that clover cannot for a time be profitably used as a fertilizer upon them, and other things must be resorted to, and to the application of such other fertilizers the so-called clover-sick soil will probably respond as readily as ever. But a judicious use of clover will rarely, if ever, bring a soil into this condition. Upon the farm I have referred to, a failure in seeding is unknown.

Since the foregoing was written, I have been advised that Prof. Atwater has more recently experimented with peas, to determine the source of their supply of nitrogen. The soil in which they were grown, was first deprived of all its nitrogen, and then supplied in measured quantities to the plants, which were carefully isolated from any effect from rain-fall or dew. The result of fifteen experiments was, that in fourteen of them there was more nitrogen in the grown plant than had been supplied, and in two of them it was doubled. Very little doubt remains that leguminous plants are in part supplied from the free nitrogen of the atmosphere, but in what way is not now known. It may be that a wise provision has prevented them from taking it "straight," lest they might take too much at once. Plants, as well as man, can imbibe too much of a good thing. I recollect very well, of spoiling some root-grafts by giving them too much nitrogen in some soil from under an old barn. So it may be, and may be for the best, that plants do not assimilate free nitrogen. If it is first forced into combinations and then assimilated, it is at least as well for us, being in either case sure of the supply. My own belief at present leans in the direction of the combinations.

There is another source of fertility of vast importance, and generally lost sight of. It was made known by one of those great minds that are not above observation of small things. He saw that the world was made up of small things, and that high up in the scale of useful animals was the insignificant and despised earth-worm, whose body in elasticity almost equals the conscience of a tree-peddler, and whose gizzard for its size is more powerful than that of an ostrich. Eight tons per acre per annum is the estimated amount of his labor. He goes sometimes to the depth of ten feet, grasps the rocks in his maw, and when he is done with them, they are laid on the surface in the form of a fine, friable, fertile loam. The evidence of this is seen in most old pastures. When we plow an old pasture, we always expect a good crop,

and we generally get it. They are very rich, and largely from this cause. I once knew of a five-acre pasture in one of the flat, clay townships of that proverbially flat county of Ashtabula, that was sown to wheat, and the yield for the field was forty-five bushels per acre. The owner was very proud of it, but he never knew who spread the fertilizer. All these years these humble creatures have been working for us unthanked, unappreciated, their labors unknown. Their reward has been the excruciating torture of being strung alive upon innumerable fish-hooks.

Of phosphoric acid I have said nothing, chiefly because I know very little about it. I have applied special manures, ground bone and phosphates, said to contain it largely, but with very little visible effect, certainly not half enough to pay expense, and I have thought best to discontinue its use. Let those use it who think best. I have no doubt it does better on some soils than on mine. The point I make is, that in general farming it is not the best nor the cheapest way to bring up and keep up the fertility of the soil. And as I always like to have my opinions endorsed by those who have the best opportunities for observation and of knowing the opinions of the best authorities, I give here another extract from Prof. Lazenby's letter. He says: "Few soils have come under my observation that, while producing good crops of clover, will profitably respond to the application of bone or superphosphate. I have a strong impression that most farmers can do better at *making* and *saving* fertilizers and judiciously using clover than by applying any commercial manures, excepting ashes, lime, and gypsum."

I know it is presumption in me, not being much of a farmer myself, to offer instruction to farmers of much larger experience, but if I must talk, I must say what I believe to be true. I don't like to give disagreeable advice, but I will venture to say, that the fashion of summer-fallowing should be at once and forever abandoned, because bare soil is always wasting its fertility, and a crop thus raised taxes the land almost double what it otherwise would. Also that meadows should seldom be pastured, never by any means in the spring, and not in the fall, unless there is an extraordinary growth of aftermath, and then only sparingly. Treated in this way, meadows will hold their own without manure, and even improve, so long as the seeding holds good. Again, avoid potato-farming, unless you have extraordinary resources for manure outside the farm. It takes away car-loads and returns nothing. I would say the same for exclusive fruit or truck farming, and the nursery business is subject to the same objections. Keep what stock you can keep *well*, and *no more*. Well-fed animals make the richest manure. In applying manure, mix it as well with the soil as possible, and as soon as possible, and not let it waste by exposure. Sell enough of the products of the farm to keep you and your family in comfort, but remember that the more you feed out, the larger the manure pile, and that land growing rich is as good as money at interest. Observe these things, and I think we may let the Mississippi river go on filling up the Gulf of Mexico, without any cause for alarm. I don't hide from myself the disagreeable fact, that some farms are not improving; I see some spots about my own little place that give evidence of it; but when I take a square, unselfish look at the matter, I see where the blame lies.

FLOWERS FOR THE GARDEN.

By G. F. NEWTON, of MILLERSBURG.

Plant flowers on the lawn—
Your homes they will adorn,
And teach your children love and truth;
Then as you're growing old,
With pride you may behold,
How they love the home of their youth.

There is a refinement in flowers, and for which they are worth the attention of every human being. Before giving directions for their cultivation, we will speak of the importance of growing them at the family home. If we would make our homes pleasant and attractive to our children, ourselves, and every person around us, we should grow flowers. No home can be too exalted, and none too humble for their cultivation.

Flowers are the emblems of God's goodness, wisdom, and purity, and are the greatest moral teachers in the kingdom of Nature. How wisely the Divine

Being has arranged to make flowers attract our attention. They might have been all of one color, and yet filled the necessary functions of the flower. They might have been green, representing youth; they might have been brown, representing old age; they might have been blue, representing distance; they might have been red, representing royalty or tyranny; they might have been white, representing purity or simplicity; or they might have been black, representing despair and death. On the contrary, by their variety in color and form, they are constantly attracting our attention, ever reminding us of the uncertainty of life and the certainty of death. In their silent way, they are ever teaching man industry, truth, purity, beauty, and love. Then should we not practice their examples and love them in return? We believe there are few persons who do not love flowers, and we rejoice in the knowledge that that love is constantly increasing. Unfortunately, with many persons, their love of flowers is not sufficient to induce them to spend a little time in their cultivation. How much better is time spent in the garden with flowers than at the dance, and carousals over billiard tables and drinking in saloons. Perhaps the persons who spend their time in such places have neither been taught to grow flowers nor their value in the family circle. They may have seldom seen them there excepting on special occasions. Having grown to be men and women with little or no knowledge of how to make home attractive, they commence the cares of family life thinking of little else than getting rich. Not rich in intelligence and the real comforts of life, but in money. Is it surprising that the mind of such persons becomes cold and sordid, and that their children have little or no love of home? A love of home should not be expected of them. There is no attraction there. Under such circumstances, the children either seek pleasure in the halls of dissipation and vice, or leave home as soon as they are capable of getting away. They seldom write home, and many of them leave with the intention never to return. In such cases the parents are likely to go in sorrow to their graves.

“Then make your home beautiful, bring to it flowers,
Plant them around you to bud and to bloom;
They will give life to your loneliest hours,
And also bring light to enliven your gloom.”

Having taxed your patience longer than we intended with this part of our subject, we will now direct your attention to the

PREPARATION OF THE SOIL,

and the making of the flower-beds.

Any good garden-soil, if kept loose and rich, will grow most varieties of flowering plants—all that are necessary for the adornment of home, and affording a constant supply, from the latter part of March until the last days of November. If the land is a little sandy, so much the better. Flowers grown in a sandy soil are usually brighter in color, and are much more easily cared for. If the land is not dry it *must* be made so by underdraining or banking up the beds. Those that cannot have a sandy soil, may improve a heavy one by frequent light applications of leached ashes and well rotted sod, or manure from the chip-yard.

Flower beds may be in any shape, according to fancy; but the soil must be rich and deep—not less than twelve to twenty inches. Perennials need a deeper soil than annuals, and bulbs and tubers a deeper one than fibrous-rooted plants. The bed for some varieties of lilies and tender bulbs should be excavated two feet deep, and eight inches of stone laid in the bottom (not pounded in), and filled to a little above the surface with the rich soil, well-rotted stable manure,

and sods. If the soil is not sandy, mix a little sand with it while filling in the bed. In such a bed, the roots of perennials get good drainage in winter, and are kept cool during the hot, dry weather of summer; and the plants, with a little attention, give good satisfaction in flowers for ten or fifteen years. All flower beds should receive a light covering of straw or litter (not hay) on the approach of winter, and occasionally a little top-dressing of well-rotted manure. The roots of most plants are very sensitive when at rest, and, therefore, the beds should not be trampled on. Much mischief is often done by cats lying over the beds in winter. After being planted, most perennials will improve for a number of years, and until they become too crowded, when they should be taken up and replanted.

WHAT AND WHEN TO PLANT.

We now come to the most difficult part of our task. Difficult because of the great variety of flowers to select from, and the great difference in our ideas of beauty. We might refer you to the hundreds of herbaceous flowering plants indigenous to our own State that are beautiful when brought under cultivation. As many of them are not easily obtained, we will direct your attention to some that are easily obtained, and will give better satisfaction than many of the wild flowers. They can be bought for a trifle of any of our seedsmen and professional florists. We can only speak of a few of these gems, giving their name, species or variety, home, time of planting, blooming, color of flower, and essential habit of the plant, beginning with perennial bulbs.

Crocus.—Of this pretty little flowering bulb, or rather corm, there are about a dozen varieties, and as many shades of color—yellow, blue, purple, white, and striped. They are among the first flowers of spring, often coming before the snows disappear. They are perfectly hardy, and very attractive, giving a succession of bloom three to four weeks. Plant the bulbs in October, three inches deep, and don't take them up for many years. The bulbs can be bought for twelve cents a dozen. They multiply rapidly.

Hyacinth.—There are many varieties of this popular flower, both seedlings and hybrids. They sprung from *H. orientalis*, a native of Asia, and in their wild state the flowers are all single, blue and pink, and very fragrant. About three hundred years ago, bulbs of this species were first taken to Holland, where cultivation brought this flower to its present state of perfection. Both double and single are in color yellow, red, pink, purple, blue, white, and many shades of each, and all deliciously fragrant. This species, when grown in the garden, commence blooming about the middle of April, and continue a succession of flowers about a month. There are other varieties of the *Hyacinth*, but none equal to the *orientalis*. The Feather *Hyacinth*, *Plumosa*, a summer bloomer, is very beautiful, but not much fragrant. The bulbs should be planted the latter part of October, four inches deep, and covered with sand. They should be taken up every two or three years, as soon as the tops have died down, and kept cool and dry until fall, when the side-chits should be rubbed off, and all the sound, large bulbs replanted as before. Bulbs may be bought for one to two dollars a dozen, according to quality.

Scilla.—This plant is called by some florists a variety of the *hyacinth*; we call it upland Squills. The flowers of the Siberian varieties are early and late spring bloomers, very bright and pretty. In colors, are red, white, and blue. The latter is a nodding flower, and intensely blue—

“As if the sky had just let fall,
A flower from its cerulean wall.”

Plant the bulbs in October, four inches deep; after which they will take care of themselves.

Tulip.—This popular flowering bulb is too well known to need much description from us. The parent varieties did not exceed half a dozen. They are all natives of Asia. Seedlings and hybrids are now numbered by the hundred, and were chiefly produced in Europe. The first to bloom in the season are the Duc Van Thol, the offspring of *T. suaveolens*. They are of many colors, and both single and double flowers, many of which are deliciously fragrant. They commence blooming in the fore part of April, and their varieties continue in bloom to the first of May, sometimes later. The late-blooming tulips, Bizarres, Byblooms, and some others, are tall, stately growers, with large cups, and of many colors, and commence blooming in May. Parrot tulips are hybrids of *T. cornuta* and *T. sylvestris*, and produce the most gorgeous flowers of any. Their large petal-like sepals are usually notched along the edges. They are of several colors, and some of the flowers have a satin finish, and, when fully expanded, measure seven to eight inches across the center. Plant the bulbs the last of October, four inches deep. They need not be taken up until the bulbs become crowded, which will not be for many years. When it becomes necessary to take up the bulbs, dig below them and thrust a spade under them and bring them to the surface. Assort out the best, and put them away in the dry for planting in the fall. Tulip bulbs cost forty cents to one dollar per dozen.

Fritillaria.—This is another of the perfectly hardy flowering bulbs worthy of a place in any garden. There are a number of varieties, among which are the King's and Imperial Crown. Both foliage and flower are magnificently beautiful, and continue their beauty a long time. They are not special favorites of ours on account of the rank odor they emit while growing. The Guinea-hen Flower, a smaller growing species, a very modest nodding flower, is our favorite among the Fritillarias. It is near the size of a small tulip, and the odor is slightly musky. The cup of the flower is beautifully marked into checkers by small purple lines resembling the markings of the Guinea fowl—hence its name. The bulbs of this variety cost but two or three cents each. Plant the bulbs of any variety in October, and take them up occasionally, treating them as Hyacinths.

Narcissus.—Some of the varieties of this pretty flowering plant, are very desirable on account of their hardiness, fragrance, and early blooming. They are especially so with us, because they remind us of the pleasure of growing them in our youth. Notable in this class, is the Daffodil and Jonquil, generally known as Easter flowers. When once established in the garden, they improve for years. *N. bicolor*, yellow center, and *N. poeticus*, white with large cup, are hardy handsome, and fragrant, and worthy of out-door cultivation. The Polyanthus Narcissus is a beautiful variety, but too tender for the garden, unless well protected. Plant the bulbs only in November and cover well. They cost 10 to 20 cents each.

Iris.—This is a showy class of perennials, having many shades of color in the same flower. The natural order is large, which with the varieties, exceeds one hundred. The plants are both bulbous and tuberous rooted. The last named are the Fleur de Lis, commonly called the flowering flag, and are hardy, showy, and fragrant, and when planted will take care of themselves. The true Iris have bulbs, and it is these we think especially worthy a place in the garden. The little Persian Iris comes into bloom with the crocus. The flower is of several colors, pearl, yellow, purple, and black, and are exquisitely beautiful and fragrant. The Spanish Iris are much like the Persian, except they grow taller, have large flowers, and are later bloomers. They are called by commercial florists, *I. hispanica* and *I. angelica*. The bulbs of the Iris should be planted in an elevated bed, the last of October, set four inches

deep and surrounded with sand. Unlike the tulip, they should be taken up each year after through blooming, and kept cool and dry until the season for replanting. If left in the ground, they make early growth of the foliage in the fall, and are sometimes killed by the winter's freezing. Bulbs cost 5 to 10 cents each.

Leucojum, or Snowflake.—The bulb of this pretty flower is worthy a place in every garden. It is a summer bloomer and continues in blossom about a month. The foliage resembles the Narcissus, but is of stouter growth. The flower is white with occasional bright green spots, and is about three times as large as the snowdrop. It hangs to the flower-spike as if by a thread, and in modesty and beauty is unexcelled. Plant in October in rich sandy soil four inches deep, and it will take care of itself a lifetime. We have a cluster of these beauties growing in our garden, that sprung from a single bulb planted there thirty years ago. Since then the bulbs have not been disturbed.

Lily.—This being the most stately and attractive of our garden flowers, it is justly entitled to the name, "Queen of Flowers," and is worthy of special care and cultivation. Lilies have large scaly bulbs that are easily broken and otherwise injured, and therefore require more attention than most of the smaller kinds of bulbs. That you may make the cultivation of the lily a success, we again remind you of the importance of good under drainage, a rich, deep, sandy soil, and the bed enough elevated to prevent the water standing there. When planting, each bulb should be surrounded with sand. In this your success much depends. The bulbs of most varieties of lilies do best if planted in October, a few do well with spring planting. They should all be set four to five inches deep. The old white lily, *L. candidum*, does best if transplanted soon after the foliage has died down, and before the new growth starts, which is in the fore part of September.

The number of species and varieties of this plant being very large, we will pass over the names of many, giving only a few that do best in our climate. Lilies, like other flowers, are of many colors, chiefly red, white, yellow, and spotted. A few of them have double flowers, but the single flowers give the best satisfaction. *L. philadelphicum*, a native, commonly called blackberry lily, having red flowers with black spots; *L. canadense* and *superbum*, splendid natives with large orange flowers, the latter has red spots; *L. bulbiferum*, a native having large orange flowers, will take care of itself after planting; *L. tigrinum*, commonly called tiger lily, a native of China, is a beautiful flower, a strong grower and very hardy. There is a double variety of this flower, but we have never grown it. The Turk's-cap lilies, *L. martagon*, natives of Europe, are very desirable flowers, scarlet, white, and purple, perfectly hardy on sandy soil. The old annunciation white lily, *L. candidum*, is too well known to require a recommendation from us; should be in every garden. There is a variety of this lily with double flowers. We do not recommend it, the flowers do not open well.

Since the introduction of the Japan lilies, most of which are hardy, this flower is more sought after. Among the many varieties, all things considered, we think the *L. lancifolium* pre-eminent. There are said to be many varieties. We readily recognize three, *album*, white, *roseum*, spotted, and *rubrum*, red. They grow about three feet high, are prolific bloomers, perfectly hardy, and exquisite beauties. When properly planted, they increase in size and number for many years, only requiring a little attention, fall and spring. The *auratum* (gold-band lily) and *longiflorum* are both magnificent flowers, but to have them do well, requires more attention than is likely to be bestowed on them, and their failure is followed by vexation.

Funkia, or Day lily, is a very beautiful border plant, easy of culture, handsome foliage and flower, is of easy culture and perfectly hardy. There are several species and varieties. The most desirable is the *F. japonica*, with large, light green foliage, and long tube-shaped white flowers, very fragrant. They are propagated by division of the roots, which are tuberous, and once established in a rich, sandy soil, will take care of themselves. Plant fall or spring, and give a little extra covering in winter. The flowers are borne in a whorl at the apex of long spikes, one or two of which open daily. If the spikes are cut off and put in a glass of water in the parlor, a new flower will open daily until all have expanded.

Yucca, or Adam's Needle.—This is a desirable plant for the lawn, the foliage being stout and of dark green color, having sharp spikes like needles, at the end of each leaf, which stands erect, and about eighteen to twenty inches high. When snow is on the ground, make a pretty appearance. The flower spike grows two to three feet in height, and sometimes bear a hundred or more yellowish white flowers, very fragrant. The plant is indigenous to the United States, and will grow in any rich soil.

Peony.—We well remember when the only variety of this flower seen growing in the flower-garden, was the old red Peony, a very showy flower, commonly called piny. The strong growing Chinese Peonies, of which there are many varieties, have nearly taken its place. They are very hardy, and of many colors, pure white, pink, rose, and violet, and very fragrant. They grow well in any good garden soil, and are propagated by division of their thick, tuberous roots. Plant fall or spring. There is a soft-wooded shrub called Tree Peony, *P. Banksii*, flowers very large and fragrant and of a pinkish purple color, and great bloomers. We planted one of these shrubs on our lawn in 1855. It commenced blooming in 1857, since which time it has not failed in blooming but two years, and that was because we failed to give it proper attention.

Gladiolus.—There are several species of this plant, but for some cause they did not attract much attention until the production of the French hybrid *Gandavensis*. Many efforts were frequently made to hybridize this plant but without success. About 35 years ago, the distinguished florist Van Houtte at Ghent, succeeded in crossing *G. psittacinus* and *G. cardinalis*, producing *Gandavensis*, from which all the popular varieties of Gladiolus have sprung.

The first exhibition of this flower in Boston, Massachusetts, was made by that distinguished American florist, Edward Sprague Rand, at the Massachusetts State Horticultural Society in 1855. Since then no flower has increased in favor like the Gladiolus. The flowers are of many colors, and beautifully grand. By a succession of planting the bulbs, we have a fine show of flowers nearly two months. They grow in any rich, dry, deep soil, and if a little sandy the colors will be brighter. Plant as soon as the ground becomes dry and warm, and for succession of flowers every two weeks thereafter until near July. For strong plants and large flowers set the bulbs, 8 to ten inches apart each way and about 4 inches deep. As the spikes are tall and the flowers large the plant is liable to break down, and therefore should be tied to little stakes. After blooming cut off the spikes a foot above the ground and about the first of November take up the bulbs, dry them a little and put them in a cool, dry cellar, secure from frost or mice.

Tigridia, or Shell Flower.—This is a beautiful class of flowers, natives of Mexico. In shape are something like the tulip, in color scarlet, yellow and orange, spotted with black or very dark red. The flowers last but a day, closing up at night and in the morning another beauty comes to take its place. They should be grown in sandy soil, in which they are easily cultivated. Plant in the spring as soon as the ground becomes warm and dry, 2 to 3 inches deep.

out too early they are likely to rot. In October take up the bulbs carefully, dry them and put them away where they will be kept cool and yet secure from damp or frost.

Convallaria, or Lily of the Valley.—This beautiful little plant is so well known that it is scarcely necessary to mention it only as a favorite. Though the foliage is not very pretty, the flowers are, and delightfully fragrant. The plant is very hardy and will grow in any kind of soil, but to have the flowers in perfection, it must be deep and rich, and the bed a little shaded. The root is creeping and is inclined to become crowded. When this is the case dig holes over the bed and fill them with a rich compost of well rotted manure and sods. Plant fall or spring. A well established bed of this interesting plant will give flowers a lifetime.

The bulbs of all the flowering plants here mentioned, excepting *Gladolus* and *Tigridia* must be in the ground, in the garden during winter, otherwise he flowers will be worthless. The French hybrid *Gladiolus* if left in the garden over winter will rot. There are some species of *Gladiolus* with pretty little pink flowers that are perfectly hardy.

Having given you the names and habits of many of our hardy flowering bulbs we will now direct your attention to a few of the choice varieties of fibrous rooted perennials.

FIBROUS ROOTED PERENNIALS.

Aquilegia, Columbine.—This is a very popular garden flower, a native of Europe and America, and will grow in any good garden soil. Both foliage and flowers are beautiful. The former is of many shades of green and sometimes variegated. The flowers are blue, purple, red, rose, orange, drab and white, and are double and single. They may be propagated by division of roots or from seed. Spring is the best season for propagation.

Althca, Hollyhock.—The stock of this plant grows from from 4 to 7 feet in height and the foliage is somewhat coarse. The flowers, which are of many colors, are beautiful, especially the double ones, some of which are scarcely surpassed by the rose. Too well known to need further description.

Delphinium, Larkspur.—Both foliage and flower of this plant are pleasing. There are many varieties all of which are pretty. In color they are light and dark blue, purple, pink, scarlet and white, both double and single. *D. formosum*. is a very fine variety, flowers large blue and white, blooming a long time. They may be grown from division of roots, or from seed sown fall or spring.

Antirrhinum, Snapdragon.—We believe the cultivated Snapdragon is a native of England. Although we have classed it with the perennials, we have frequently seen them bloom profusely the first year from the seed, and after blooming, we have, also, seen them live and bloom many years, giving good satisfaction in flowers. The plant is very hardy and grows well in any rich, deep soil. The flowers are of many colors, and shades of color, and are beautiful.

Dianthus, Pink.—Most of the varieties of this flower are hardy perennials, and all do best in a dryish, deep, rich soil, and if a little sandy, so much the better. They are natives of Asia, Africa, and Europe, and no flower stands higher for its neat habit of growth, beauty and fragrance, and ease of culture. The grass-like foliage of the early blooming varieties which is a glaucous green, may be made to present a more beautiful appearance after the plant is through blooming, than when in full bloom. This is done by shearing off evenly the flower stalks just above the leaves. In a couple of weeks it becomes one of the most beautiful green beds, and will remain so until winter sets in. The early pinks commence blooming in May, some in June, and others not

until July. To grow the Carnation in the garden summer and winter, requires the greatest of care, and perhaps after much trouble proves a failure. The Picotees are a little hardier, but they too may prove a failure, and therefore it is better to keep them in the cold frame over winter, and transplant in the open air after the weather becomes settled. The May Pink comes best when propagated by division of the roots; other varieties perhaps the best from seed or by layering.

China Pink.—*D. Heddewegi* and other varieties of this species produce splendid flowers of many colors and are unsurpassed in the beauty and brightness of color. The flowers are both double and single, and some of them quite large. They are more properly biennial plants, though many of them bloom the first year from the seed, and yet live and flower many years. Some of them are quite fragrant, though not generally so. They are the easiest grown from seed, which may be sown fall or spring. A flower garden is not complete without the China Pink.

Phlox.—Of this plant, the varieties are many. It is so well known that it will receive but a passing notice. It grows two to four feet in height, and as the flowers are in large clusters make them very attractive. The early varieties commence blooming in June, which are succeeded by others keeping up a succession of flowers until the approach of frost. Unless new varieties are wanted, you will get flowers much sooner by a division of the roots, which may be planted fall or spring.

Chrysanthemum.—This is the last of the out-door blooming plants for this latitude, often beginning after the frosts have killed most of the season's vegetation. It is especially popular on account of its late blooming, as well as the beauty and fragrance of flower. Since our earliest recollections, it has been the popular autumn flower. The introduction into Europe, of the little China Chrysanthemum, called "Chusan Daisy," and its hybridization with the older sorts gave this flower additional popularity. Since then the Pompon hybrids, which are great improvements in form and brightness of color, take the lead.

Although the Chrysanthemum is a hardy plant, to have it do well, it must be grown on a rich, light soil, and if the plants are sheltered a little, the bloom may be continued a month longer than the usual time. The early varieties commence blooming about the middle of September, and the late bloomers continue until the last of November, usually giving a succession of flowers in the garden over two months. Propagate by division of the roots. Don't cut off the flower stalks as soon as the plant is through blooming, break them down a little, letting the tops remain about the roots. They will protect them during winter. The roots are easily dried out in dry weather in spring, therefore keep them well protected until they get a good start.

Daphne cneorum.—This exquisitely beautiful little plant is a low growing evergreen shrub, and entirely different from the classes of plants here spoken of. It flowers freely very early in the spring; and also at intervals through the summer, and quite late in the fall. The flowers, which are very fragrant, are bright pink, borne in a small umbel, somewhat resembling a minute bunch of honeysuckle, their pink flowers contrasting beautifully with their dark green foliage. This plant must be grown in a deep, rich, sandy loam, and the bed elevated. The plant does best when a few evergreen branches are stuck in the ground about it in the fall, so as to shade it a little from the bright sun in winter. When so treated, the foliage retains its rich, dark green color, and the flowers are more abundant in spring. Not having seen this plant in any of the nurseries excepting that of Storrs Harrison & Co., we think it is not in general cultivation. We have been growing it about fifteen years, during which time it has given perfect satisfaction, and had many admirers. One cyme of this

flower and a blossom of the tuberose, makes the most charming little bouquet.

As we have continued this article longer than we intended, we will pass over all biennial and annual plants, and close by a few words on cultivation, which we trust will be profitable.

When planting, do not crowd the plants. Many of them have large bulbs, tubers, and roots, and when set too closely, become sickly, resulting in premature decay. Give clean culture, and in doing so, do not dig close about the roots of the plant. Cover the beds a little in the fall with light, dry covering just before frost sets in, and in the spring uncover by degrees, as the weather becomes fine. Never tramp the beds, always keeping them loose and rich. A distinguished American florist, in giving directions for the cultivation of flowers, says, "A plant is a living being; it drinks and breathes; it is as sensitive as the most delicate constitution to changes of temperature, and extremes of cold and heat; its tissues are as delicate as any in nature; its wants must be attended to as they arise, and neglect is sure to result in disease and death. There are two extremes in plant culture as usually pursued: The plants are either starved to death, or overfed; the result is the same, whether caused by neglect or kindness."

RECOMMENDATIONS.

BY REV. ANDREW WILLSON, OF RAVENNA.

The value and necessity of letters of introduction are generally recognized. Some men carry in their faces and exhibit in their deportment, the credentials of worthy or unworthy character, so easily read that but few are deceived. The true character of others, perhaps of the majority, is more hidden or concealed, and liable to be misunderstood, so that when a person intends to engage in business among strangers, journey to a distant State or travel in foreign countries, letters of introduction and recommendation are not only convenient or helpful, but frequently indispensable.

Now, what is true of persons, is also substantially, in some measure, true of trees, plants, and seeds. In many instances, a thorough botanist or specialist, may be able to determine the variety of tree or plant from the external appearance; but only a very limited number are thus qualified, and they would be liable to make many mistakes. The products of the nursery, green-house, or flower garden need letters of introduction to the world. The beauty of the flower or fruit may attract attention, but many questions will arise concerning their value, habits, growth, and productiveness. He who loves to experiment and has time for the same, may frequently be content to wait the slow process of natural development. But the majority have but little time for new experiments, and no one could avoid taking many things on the recommendation of others.

If you need a competent, reliable gardener or florist at a busy season, you do not desire to try experiments. You advertise for some one worthy and well qualified, who can bring testimonials from former employers, or persons of intelligence and character. So the practical gardener, fruit-grower, or florist has not time to largely experiment with seeds, trees, or plants. He wants articles that can be depended on. Articles that have been furnished with letters of recommendation by worthy and competent persons.

To a young man going among strangers, a recommendation from some one of known reputation will serve as a passport to confidence, hospitality, and social position. The presentation of a letter from some friend will open your homes, and, in some measure, your hearts to an entire stranger. Your confidence in the honesty and judgment of an old neighbor or friend will be manifested in your treatment of the bearer of a letter from the same.

The financial, as well as the social value of recommendations, is recognized every day. In the newspapers read the columns of "Wanted," and you will soon discover the importance that business men attach to references and certificates of qualification and character. Does a man advertise for a clerk, or book-keeper, or any other help, he will state that references must be given. Does a woman want any domestic help, she will demand some reasonable assurance of ability and character. Does a man apply for a position of honor or profit in the gift of some honest and qualified person, the application must be accompanied by recommendations, or it will be likely to share the fate of anonymous communications to printers. So when new

new varieties of fruit, vegetables, or flowers are sent into the world, they must carry with them letters of recommendation. Without such, these new aspirants for public favor and patronage would receive but little attention.

This fact is quite generally recognized. The value of honest commendations from competent persons is unquestioned. Unfortunately, all letters of introduction are not of this class. Too many are not worth the paper upon which they are written or printed. They are so frequently injudiciously given that the cautious and prudent will examine them closely and discount them largely before accepting them. The facility with which recommendations can be obtained is simply astonishing. This is true whether they refer to persons, patent medicines, trees, plants, seeds, or almost any thing else.

In a letter concerning the postmaster at Rome, N. Y., addressed to the Postmaster General by President Cleveland, are words that may apply to other kingdoms than that of politics. It seems that an official examination of the office at Rome "developed the most disgraceful confusion in all that pertains to the accounts and financial condition of the office." Both the honesty and competency of the postmaster were largely lacking, and yet President Cleveland remarks: "The fact that I have before me documents signed by many residents of the city where this postmaster is located, and who belong to both political parties, asserting their entire confidence in his honesty and fidelity, demonstrates the unfortunate facility with which such papers may be obtained, and gives rise to an unpleasant suspicion touching a too prevalent standard of political honesty."

It is unfortunate that this "unpleasant suspicion" is not limited to the political world. The field of horticulture is frequently lamentably afflicted by extravagant and unreliable recommendations. Every year, honest people are deceived by statements that facts will not justify. New aspirants for the market are sent out with extravagant recommendations that in phraesology would do credit to any enterprising patent medicine proprietor. People read the catalogues with eager surprise, and almost imagine that the "millennium" has come in the department of horticulture. But they learn, frequently from sad experience, that the trees, plants, and seeds will not lie, either to save the reputation of the salesman or the feelings of the purchasers. Nature's laws will assert their claims, however contrary to all recommendations. The ease with which these are too frequently, and sometimes unjustly obtained, detracts from their practical value. Thoughtlessly, or from motives of policy, many will give recommendations of which they should be heartily ashamed. So extensively are such given and used, that many have become suspicious of every thing that is presented.

Many are not sufficiently cautious in their use of language. Many a recommendation has been spoiled by its extravagance, and has proved a damage rather than a help. When a man is transformed into an angel before he ceases to be a man, we are naturally suspicious of him. He is too good to be good for much. Many people are afraid of the perfect man, and words of introduction that sound like flattery, fail to inspire the desired confidence in thinking, close-observing minds.

So in the kingdom of horticulture. Many statements published, by their very extravagance, create suspicion in intelligent minds, and it is surely a safe and wise rule for amateurs not to invest much, if any, in prodigies that are advertised in various ways as earlier, larger, and better than all their predecessors. It may be laid down as a rule generally true, that wise and honest men will not use extravagant expressions in recommendations. And it is equally true, that worthy and well qualified persons will not publish such to deceive and disappoint their patrons. To beware of flaming advertisements, gawdy representations, and "cheeky" agents is surely a mark of wisdom, and will save the mortification of severe disappointment. Be cautious about giving large orders to the men whose trees, plants, or seeds are *far superior* to those offered for sale by old and reliable firms.

To those who are asked for recommendations, a suggestion may not be inappropriate. It is well to know what you are doing, before signing any paper or statement. Wise caution is due to both yourself and the world. By signing an extravagant and unreliable statement a man lessens his reputation for truthfulness. It requires moral courage to say "No" when some neighbor or acquaintance requests a letter of introduction to some personal friend, or words of recommendation "to whom it may concern." But a man should be honest and do right. Each should be honest with himself, with the applicant, and with the world. How, then, can a man knowingly furnish an undeserved recommendation, without injuring himself by loosening the foundations of true moral character? And we have no right to certify to what we do not know or honestly believe. Neither ignorantly nor knowingly have we any

moral right to impose an unprincipled man or inferior articles upon others. To justly recommend is a pleasure, but from undeserved statements, conscientiously withhold your signatures.

"Who recommended such an article?" "Mr. B." "I know his reputation, and I do not want any thing that he recommends, unless I personally know the article." "Did you say Mr. C.?" "That is satisfactory. He never intentionally deceives nor hastily nor thoughtlessly recommends any variety of fruit or flower, and what he endorses, I will not hesitate to purchase." Thus, when a man signs a recommendation his reputation and character, and the welfare of others are involved in the transaction.

Have moral courage to say "No" to every thing unworthy, and "Yes" to all requests to endorse whatever you intelligently believe is deserving the attention of honest men.

FORESTRY AND KINDRED TOPICS.

The following selections for our appendix, upon this important and interesting subject, are from various sources; but largely from the valuable compilation of Secretary C. W. Garfield, the able and wide-awake Secretary of the Michigan Horticultural Society. We have also, in our Appendix made several useful selections from the discussions and papers of the Reports of the Michigan, and other Horticultural Societies, of matters which have a common interest for horticulturists in all sections.

DESTRUCTION OF FORESTS.

Regarding the destruction of our forests of timber, Mr. Perry Hannah, of Traverse City, Michigan, said in the course of an interview, that the pine forests of this State would last about ten or fifteen years more; that is, before the year 1900 the great lumber industry of Michigan would have died out for want of material. There seems to be no way to prevent this result. The owners of the pine lands bought them for the special purpose of converting their growth of pines into logs, lumber, and cash. It seems like a work of devastation, but, whether the rapid clearing will in the long run appear to be the most profitable move in a business view or not, it is progressing too rapidly, and the plants for logging, sawing, and transportation, are too extensive and too well established to admit of any doubt that the manufacture will go on till there is not a merchantable pine tree left standing in the lower peninsula.

The same fate is in store for the hard-wood lumber trees, of which there is such a splendid growth in the northern part of the State—ash, maple, birch, and others. Within the last ten years, and chiefly within the last five, steam and water mills, have sprung up for the manufacture of these woods into lumber for house finishing, furniture, and cabinet work, and they are increasing at a rate that promises to exhaust the supply during the lifetime of some who are now engaged in the business. The sugar maple is especially in demand, and factories for making the bird's eye veneering are to be found in many of the maple localities. Denuded pine lands in other States have become "barrens." There are great tracts in this State which the owners do not reckon worth paying taxes on, now that they are stripped of their trees. Unless some care is taken, thousands and thousands of acres in Michigan will become worthless.

N. H. Eggleston, in Harper's Magazine, states some facts in an off-hand way, which bear upon this subject of timber destruction:

In our country we have gone to the forests in a kind of freebooter style, cutting, and burning more than we could cut, acting for the most part as though all the while in a frolic or fight, until now at length, after a century or two of this sort of work,

we are waking up to the facts that our once boundless woods are disappearing, and that we are liable to suffer no little loss thereby. But it is only the few who seem now to have any adequate sense of our condition as affected by the threatened loss of the trees. In a recent publication issued by authority of one of our western States for the express purpose of attracting settlers from European countries, the statistics of its great lumber production are elaborately set forth, accompanied by the assurance that the present enormous consumption of trees for this purpose, may be continued ten or fifteen years longer before the forests will be destroyed. The cool unconcern in regard to the future shown in this is very noticeable. "After us, the deluge." A corresponding feeling, though working on a much smaller scale, is seen in an advertisement, and of a class often appearing in our older States. "Brace up, Young Man. You have lived on your parents long enough. Buy this farm, cut off the wood, haul it to market, get your money for it, and pay for the farm. The owner estimates that there will be 500 cords of market wood." And so, all over the country, on the large scale and on the small, the axe is laid at the roots of the trees, and our forests are disappearing. It is estimated that 8,000,000 acres of forest land are cleared every year, and that in the ten years previous to 1876, 12,000,000 acres were burned over simply to clear the land.

TREE DESTRUCTION, WITH SUGGESTIONS.

Henry Stewart says that it has been said of American agriculture that we skin the land and leave the carcass to go to waste, while we proceed to seek another victim of our unprofitable cupidity. And it must be confessed that the American farmer's march of conquest across the continent has been marked by thousands of barren and forsaken fields. The forests have been laid low and consumed by fire; the soil has been cropped and exhausted, and the land has been abandoned for fresh fields in the west. But the lumberman's methods have been still more swiftly destructive. They have been like the ways of a beast of prey which strikes down its victim, sucks the blood, and leaves the rest for the worms, or for slow decay. The timber-forests have been cut over, the best trees only being taken, while the young timber has been crushed and broken down and consumed in the conflagrations which have burned up the debris. Indeed, in perhaps the majority of cases there has been a larger value of useful timber left upon the ground to be burned than has been removed by the axe and saw, for the lumberman took only the best and clearest, which would make the most valuable lumber. And so the forests have been cut down, and the dead timber, until the fire consumed it, became a source of pestilence to the remnant which has been left alive, just as dead carcasses bring death to the living animals. For vast myriads of insects, chiefly wood-consuming beetles, have fed and bred in the dead timber, and have increased until the living trees were attacked by the ravenous hordes and killed by acres. The writer has seen enormous living pines—the stately monuments of centuries—in the forests covered with thousands of the capricorn beetles, which were depositing their eggs in the bark and feeding upon it. The next year the huge larvæ of these beetles could be heard gnawing into the hearts of these trees, leaving large burrows, which killed the trees, and utterly spoiled them for lumber; and the noise of their gnawing could be heard like a breeze swaying the tree-tops. So that one of the results of the reckless waste of timber in the woods is to bring a pest upon what is left, which quickly destroys it. And it is to such a result that the loss of thousands of acres of timber in the eastern and western forest regions every year is due. It is a question, indeed, if there is now any remedy, and if an irreparable injury has not been already inflicted upon the timber that is left.

But as a wise and careful system of agriculture might have left our fields

still fertile and productive, so an economical use of the forests might have made them a perennial source of wealth. Fortunately the injury is not beyond a remedy, for it is easier to restore a growth of timber, than it is to bring back fertility to a barren soil. It is easy to care for what is left, and to replant and renew the growth, and even to do this better and more quickly and with more and quicker profit than nature has done it. It is easy, too, by a wise and practical use of the forests that are left, to so husband them as to take regular harvests from them as the farmer regularly harvests his fields or selects the fatlings from his flocks. He does not gather in all these at one fell swoop, taking the fat and the lean and the young and the old, as the fisherman gathers all into his nets, and as the lumberman has felled the woods, but he selects those that are ripe, and carefully rears the rest until they are ready. Had the timber been culled in this way from the forests, year by year, there would have been a periodical harvest, and as the mature trees were cut out, a new growth would spring up. But, on the contrary, as in the old fable, the goose has been killed for its golden eggs, and the source of lasting profit has been recklessly sacrificed.

Fortunately, the land is left, and can be put to its proper use as soon as it can be controlled. And still more fortunately, by a wise administration, the forest may be made a profitable source of public income, instead of, as heretofore, the prey of the spoilers. It is useless to complain of past mistakes. They have been, as we have pointed out, mere incidents of our system, and possibly unavoidable. But the time has come when the system must be changed, and the necessity of a change has become so apparent that it cannot be long delayed. It is not only the commerce of the country that must suffer by a continuance of the system, but agriculture suffers still more; and it is not only the public who will gain by a change, but the example will be followed by the farmers, who will, doubtless, soon learn to take care of their own timber-lands and plant more, and so the benefit will be general. Besides, the farmers will not be long in discovering the profit in growing timber, and would plant groves as one of the most profitable crops that could be grown upon their rougher lands, or as a resting and restorative crop for their worn soil.

TRANSPLANTING TREES.

John J. Thomas says that it is a common practice, in setting out maples and other shade trees along the borders of streets, to remove nearly all the tops by a single cut across the stem, converting the trees into blunt-headed poles; the object being, to reduce the mass of leaves which the mutilated roots must support, and lessen the action of winds. The operation is usually successful, but it is a long time before such trees attain a handsome or symmetrical form. A much better way, after having secured a copious supply of roots by careful digging, is to avoid cutting off any large limbs (unless to give the head a good form), but to thin out all thick, small branches and shoots, leaving only a few evenly distributed, and cutting partly back all that remained for reducing the amount of leaves. In this way we retain the form and size of the head to a greater or less degree, with little draft on the shortened roots, and little chance for the winds to affect them.

To take up a young forest tree, says a correspondent to the *New York Tribune*, first wind a wet sack around the stem, close to the ground, so tightly that it cannot slip; then take a timber-hitch with a small cable-chain, cut off a few roots on the side opposite the steady team, and you will get nearly every

root whole, and plenty of soil. I took up one hundred rock maples in this way, last spring, after I had learned to wind the sack properly, without damage to the trees. In this way, two men with a team will take up more trees in an hour than they could without a team in half a day.

TREES IN OPEN FIELDS.

It is a matter of common observation, says *Forest Leaves*, that whenever any tree grows in an isolated position in the open field, it will form a very short trunk and a large spreading top, and that while trees grown for their fruit yield the best returns when of this character, quite the reverse is true when the object of its production is timber. By observation of natural forests, and from the experience of planters in Europe and elsewhere, we learn that the best timber results are produced by planting the trees closely enough at the start, so that after a year or two of cultivation a constant shading of the surface will be maintained during the growing season, and at the same time each individual tree will have enough room to make a healthy growth, thinning out by removing alternate trees, from time to time, as more space is required.

CARE OF TREE SEEDS.

It is a very natural thing for one to do, who has cared for the seeds of the farm and garden, to spoil tree nuts the first thing he does with them, after gathering them. Why? Because he knows that it is the right thing to do when he wishes to save, in the best condition for planting, corn, peas, wheat, oats, etc., or nearly every seed of the farm or garden, to first carefully dry them, and then put them away where they will keep dry until he wishes to plant them. Therefore, when he gathers a nut for seed, it is natural for him to treat it in the same way. The result—failure. He should have very carefully observed how Nature cares for a nut during winter. She don't dry it, but lets it lie on the cold, damp ground, covered with leaves until spring, when it grows.

NUT TREES.

I know of no more enjoyable thing about a farmer's house than a small orchard of nut-bearing trees. An acre or two devoted to this purpose will do as much to keep the boys and girls at home while young, and to make the memory of the old home blessed in after life, as anything that I could name.

Do not say, "it takes too long to get the trees in bearing." I have young trees growing that are the grandchildren of those that came from the nuts that I planted only twenty years ago. I was sixteen years old then, and am not a very old man yet. I feel a keen enjoyment in raking over the golden leaves and searching for the rich, brown nuts as any of my younger friends, and I hope to experience the same enjoyment, and appreciate it, too, for many years to come.—PROF. JAMES SATTERLEE.

PROFITS IN TREES.

The *Forestry Bulletin*, in commenting on the extravagant statements of enthusiasts, remarks quietly :

In forestry, unfortunately, the calculation of profits is complicated, from the fact that the full returns on our capital cannot be expected for one hundred, eighty, or sixty, or, as some advocates of rapid growth will have it, forty years from the start of the plantation. If, then, we begin with a soil, the price of which was thirty dollars per acre, on that part of the investment alone, the returns will have to be, taking a rotation of sixty years, five hundred and sixty dollars, to pay interest at five per cent. Mr. Foster, of Muscatine, Iowa, calculating for profit, allows one hundred dollars for the plantation of one acre. This amount would demand, at the end of sixty years, \$1,868, in order to cover interest on the investment, or the whole acre must have produced \$2,400 in sixty years. This amount will be somewhat modified by returns from thinnings during the time of rotation, with compound interest added up to the end of sixty years. But taxes, and the extra profit which any man expects from an enterprise so hazardous as forest-growing, will more than counterbalance this amount. In walnut, one hundred dollars per one thousand feet, clear of expense, we would have to cut, at sixty years, twenty-four thousand feet of clear timber! We doubt whether this will ever be done.

Yet we do not mean to discourage forest-planting by these expositions; we only want to direct attention of forest-growers to the necessity of simplifying and cheapening methods of forest-growing, and of selecting such soils as can not be utilized to better advantage for agricultural purposes. Fortunately the demands of forest trees on the soil are very insignificant. While the agricultural crops deprive the soil of its rarest mineral constituents, tree-growth makes demand only on the physical properties of the same, taking its nourishment mainly from the air. The poor soils, therefore, are those which in a highly cultivated country will be properly devoted to forest growth.

In the year 1820, the late Zachariah Allen came into possession of forty acres of worn out pasture land lying on a bleak hill near Providence, R. I. Some scant herbage grew in the soil which lay between the projecting ledges of granite, and a few white birches kept up a struggle for existence with cat briars, but the land was practically worthless for pasture or tillage. Wherever the surface could be scarified, between the rocks it was broken up and seeds of chestnut, locust, and varieties of oak and hickory were sown in shallow furrows or dropped and covered by hand where it was too rough for a plow to run. The entire cost of planting was \$45, but Mr. Allen lived to see his forest furnish locust timber for the navy during the war, and his ledger, after fifty seven years of careful entries, with interest computed on every outlay, showed a profit of more than \$2,500, amounting to nearly 7 per cent. per annum upon the original investment, and that, too, after estimating his land above its actual value. Besides the value received in money from the sale of fuel, posts, hoop poles, and timber, the soil had been enriched by the decaying leaves of sixty autums, and the land was left in condition to sustain a forest growth indefinitely without further expense.

It is a great deal easier to figure on paper sometimes than to realize large profits in actual business. We give the following for what it is worth :

Mr. C. B. Wilson, of Jacksonville, Ill., drove me out to his farm sometime ago to see some black walnut trees. "These trees," he said, "were planted from the seed twenty years ago. I saw them planted." I measured these trees and they were sixteen inches through. They would saw into timber a foot of clear black walnut boards, and then have the top, limbs, and stump

left. The stump itself would sell to day for five dollars to be sawed into veneers. The boards would be worth thirty dollars. "What could you sell these trees for, to timber men, as they stand?" I asked. "I could sell them for twenty five dollars per tree, and ten years from now, they will be worth \$50." From these facts I came to this conclusion: A black walnut tree will pay \$1.25 per year for twenty years. A thousand of them will pay \$1,200 per year. Now every Illinois farmer has had it in his power to make more money off a row of black walnut trees around his farm than he can make off his farm if sowed in wheat. How can he do it? This way: A farm of 160 acres would be 10,500 feet in circumference. Now plant walnut trees four feet apart all around it and you will have 2,625 trees, which will be worth \$25 a piece in twenty years. Again a farmer can set all his sloughs, low places, and all hog pastures into black walnuts. Two thousand handsome walnut trees growing on a farm, would be worth \$50,000 in twenty years, and would not interfere with the farm at all.

CUTTING TIMBER.

Dr. R. C. Kedzie says that if trees are cut at any time after the leaves are fully developed and in most active growth, the branches and leaves being left on till the leaves completely wither, and the bark is removed from the body of the tree, the best results will be secured for lasting timber. This is the European plan. The leaves draw out much of the sap which contains the most fermentable substance in wood, and that which furnishes food for worms which prey on wood. By cutting off the branches and leaves as soon as the tree is cut down, the pumps are stopped which would nearly pump the tree dry. In removing the bark, we expose to the air and rain that portion of the wood richest in albuminous and putrescible material, and which serves as the breeding place of destructive worms. If this is washed and dried by natural agencies, the quality of the timber would be much improved.

In the same strain, the *Country Gentleman* remarks: For forty years, we have urged the importance of cutting timber when it could be seasoned rapidly, for the purpose of rendering it durable. Cases have been cited by us where trees were cut while in a rapidly growing state, and stripped of their bark, and then sawed or split into boards, scantling, plank, or rails, and rendered durable by being subjected to the drying of summer winds and sunshine. This treatment seasoned them into almost imperishable hardness. But if cut in winter or early spring, they soon became sap-rotten, and last only a few years at the longest. Young basswood shows this difference in a striking manner, summer-cut and seasoned rails becoming nearly as hard as horn, while winter cut was worthless from rotting in a few years.

Prof. Budd tells of the method pursued near Moscow to test the matter of season in cutting timber as affecting its durability, and says:

As the united results of many trials made under the direction of the Russian government, it has been decided that the best time to cut trees was near the end of June, while the bark would peel freely. The practice now, is to strip the bark up as far as they are used for timber, and the leaves are left on the rest to pump out the sap. Within a few days they are sawed or split into lumber or posts and dried rapidly.

The *Northwestern Lumberman*, arguing with its mill-owning patrons against the practice of cutting the small as well as the large trees, says that beef-producers do not send their calves to the butcher, and that those who raise and sell every other crop except lumber, only market what is mature. To the argu-

ment that it costs too much to go over the land twice, the answer is, that taking the small with the large, reduces the quality so much that the profit is diminished more than it would be by the extra cost of getting a given amount of logs by selecting only those large enough, leaving the rest to grow.

Some say, that cutting as they do, they have enough to last from ten to twenty-five years, and that after that they will be beyond caring for lumber. But a farmer might say the same; he may be dead a quarter of a century hence. Yet a thrifty man takes pains to make his farm better every year, so that it will be a desirable inheritance for his children.

In sharp contrast with the economical course of many of the Maine lumbermen, whose woods now continue to yield fair log crops every year, is the slap-dash style in which the pine of the Northwest has been dealt with. The same thoughtlessness of the future has marked the waste of the splendid hardwoods, especially black walnut, in Ohio and Indiana, where millions of as fine trees as ever grew, were logged and burned to make room for the plow. In most of these cases had three, of the largest trees been left on an acre, they would now be worth more than the land. Even since black walnut rose so greatly in price, instead of learning from their former error, many farmers have cut the last little sticks, which were worth almost nothing, instead of leaving them to grow till they would bring a good price. A few wiser ones have fine walnut groves not yet mature, which they refuse to sell.

CATTLE IN WOODLANDS.

A recent writer makes the following positive statement concerning the tramping of cattle in woodlands:

"Not a hoof should ever be permitted to make a track in a wood-lot that is meant to be a permanent and productive forest. Such a forest should contain healthy trees of all ages and stages of growth. A thrifty underwood is an essential part of a permanent forest, and browsing animals destroy the hope of future timber. It is a poor wood-lot that is not worth protecting."

We select the following as worthy of a careful perusal:

Mr. Henry Westney, Highland Creek, York, says: "As far as I have observed, the result of cattle being kept out of the woodland, has been a dense growth of young trees of remarkably straight and rapid growth; while on the other hand, in those pieces of bush to which they are allowed free access, the undergrowth is very scant, small, bushy trees, trimmed like a hedge, or broken down and destroyed by them."

Mr. S. A. Ramsden, Sherkston, Welland, says: "I have noticed that where cattle and horses are pastured in the bush, they keep down all the second growth, and the trees are rapidly dying off; and I have also noticed that where the woodland is not pastured, the trees look much more healthy, and there is almost invariably a thick undergrowth."

Mr. George Sanderson, Colborne, Northumberland, says: "I have kept cattle out of a small wood-lot, and now it is so thick with small, young trees that one can hardly get through. There are lots of maples, ironwoods, beeches, and basswoods, from six to twelve feet high—just right to set along the fence. Some are from one to three inches in diameter. I think the large trees are growing better and looking more thrifty than they did before I gave up pasturing. I let the cattle run in the wood now after harvest, and they do not seem to do any damage. I am sure it will pay to keep the cattle out for a few years at least."

Mr. R. Postans, Oakville, Halton, says: "I know that cattle will some-

times destroy a great number of young trees. In a dry time, when pasture was almost burnt up with drought, I have seen an ox bend down a young sapling over two inches in diameter and twenty feet high, keeping his neck over it till he had broken it down, or holding it down till he had browsed the top."

Mr. David Spense, Whittington, Wellington, says: "A friend of mine fenced off five acres of bush for the purpose of allowing the second growth every chance to grow; and I assure you it is beautiful to look at; in three years you could not see a man a rod off, it was so high and so thick. There would be no use in keeping cattle out five, six, or even seven years, and then letting them in. I have seen cattle in a bush throw their neck over a sapling like a handspike, and would bear it down until they had eaten all the foliage off; then it is sure to die."

FOREST FIRES.

The *New York Tribune* remarks regarding tree destruction by forest fires:

"The increase of forests in our country, and their protection and preservation until the proper proportion be permanently secured, should every where be considered of public importance; while decrease and diminution, no matter from what cause, should be treated as a public calamity. To burn a building is by our laws made a serious crime. To burn a forest goes entirely unpunished and almost always unpaid for, no matter how opulent the incendiary. In the former case, at worst, only few suffer loss, and that reparable; in the latter, the evil may continue as both a public and a private injury for all time. To cause a forest fire, either by carelessness or design, should be treated and punished as a crime. It should also be made the special duty of some local town officer to bring every offender to immediate justice."

Orange Judd is responsible for these suggestive notes:

"Many of our best forestry students attribute the treelessness of western prairies to the annual fires that have swept over them from time immemorial. However true this may be, it is certain that the greatest enemy to our forests to-day is this same ruthless enemy. Every autumn comes reports from different localities of forest fires invading hundreds of acres of woodlands, not only doing great direct injury by destroying timber, but indirectly, by giving free scope to winds, and stopping the many other important climatic functions of forests.

"Almost all of these forest fires are the direct result of man's carelessness—a sportsman lighting his cigar or pipe, and heedlessly throwing the match among the dried leaves or grass, to kindle a flame which he can never quench, or a ruralist burning a rubbish heap, and not taking sufficient care that all possible contact with the adjacent forest is cut off. Such carelessness is worse than criminal, since it is impossible to atone for the loss of life and property that may ensue. More than this, it is not merely a crime affecting a few individuals, but it is one which, in many ways, touches the well-being of the community at large. Yet knowing the source of danger, makes it all the easier to apply a remedy, and the first step toward the accomplishment of the desired purpose is to awaken the public, not only to a knowledge of the benefits derived from forest growths, but also to a realization of wretchedness that may be caused by a single careless act. Many a forest conflagration may be avoided by clearing up all underbrush on the borders of woodlands, and especially on all strips of land connecting adjacent forests. It is a comparatively simple matter to clear out the inflammable dead trees, branches, etc., for, say a quarter of a mile along the border of a wood. To do this is a duty which every owner of woodland owes not only to himself but to his neighbors."

TREE-PLANTING ABOUT HOUSES—TWO VIEWS.

It is with some difficulty, often, when looking up a subject through what experts have written regarding it, to decide as to just where the truth lies, when we have equal confidence in parties that seem to make statements and draw conclusions very diverse in character. We have had this forcibly illustrated within the past few days, while looking up the sanitary effects of tree-planting and forest growth.

We can only account for the differences in the same way that, some time ago, we harmonized two descriptions of a building given by two truthful children, their narratives differing in many essential particulars. Upon inquiry, we found that one had looked at it from the rear, and the other had taken a front view.

In a recent address by Dr. R. C. Kedzie, whose opinion we hold in the highest esteem, he cites the following cases as coming under his own personal observation :

“Two brothers in Vermont, of strong and vigorous stock, and giving equal promise of a long and active life, married wives corresponding in promise of future activity. They both had chosen the healthiest of all callings—farming. One of the brothers built his house in an open and sunny spot, where the soil and subsoil were dry ; shade trees and embowering plants had a hard time of it, but the cellar was dry enough for a powder magazine ; the house in all its parts was free from every trace of dampness and mould ; there was a crisp and elastic feel in the air of the dwelling. The farmer and his family had that vigorous elasticity that reminds one of the spring and strength of steel. Health and sprightly vigor is the rule, and sickness the rare exception. The farmer and his wife, though past threescore, have yet the look and vigor of middle life.

“The other brother built in a beautiful, shady nook, where the trees seemed to stretch their protecting arms in benediction over the modest home. Springs fed by the neighboring hills burst forth near his house, and others by his barns ; his yard was always green, even in the driest time, for the life-blood of the hills seemed to burst out all about him in springs and tiny rivulets. But the ground was always wet, the cellar never dry, the walls of the room often had a clammy feel, the clothes mildewed in the closets, and the bread moulded in the pantry. For a time, their native vigor enabled them to bear up against these depressing influences ; children were born of apparent vigor and promise, but these, one by one, sank into the arms of the dreamless twin-brother of sleep, under the touch of diphtheria, croup, and pneumonia. The mother went into a decline and died of consumption before her fiftieth birthday, and the father, tortured and crippled by rheumatism, childless and solitary in that beautiful home which elicits the praise of every passer-by, waits and hopes for the dawning of that day which shall give him back wife and children, an unbroken family and an eternal home.”

Another authority, which we respect very highly, presents the following statement of opinion, based upon a wide experience :

“It is by no means uncommon to hear persons supposed to be well informed say : ‘Smith has a beautiful place, but there are too many trees about it to be healthy—malaria, you know.’ Nothing can be farther from the truth than this. So long as the trees are not so numerous as to prevent the admission of sunlight, and the free circulation of the air, they are preventers rather than promoters of malaria. True, under some conditions, trees may be so massed as to keep the soil too damp, but this rarely happens. Ozone, which conduces to health in a high degree, is produced abundantly by trees, and it is no sur-

prise, then, to learn that the atmosphere of forests is highly charged with ozone, while in the air of cities there is none. Ozone destroys nuisance and disease germs, and disinfects decomposing matter. The popular opinion regards the woods as a breeder of malaria—a vulgar error. The malarial poison is engendered only where there is air, and moisture, and sunlight. Abundant sunlight is one of the essentials. In the primeval woods of all countries, malarial fevers are unknown. The pioneers suffered from malarial fevers, not because they lived in the woods, but because they were compelled to clear away the forest and admit the sunlight, and turn the virgin soil.

“In cities a large part of the waste goes into the soil, which thus becomes saturated with organic matter, and thus, decomposing, breeds a large class of disorders. But what is poison to a man, is food to the tree, which sucks up the unwholesome elements, purifies them, and returns part of them to the atmosphere, sweetened and wholesome. But it is not the soil alone which is purified by the action of trees. A man inhales the air, absorbs its oxygen, and exhales it in the form of carbonic acid. This last, if present in considerable quantities, is destructive to human life, so that if a man were shut up in a room in which there was absolutely no ventilation, his death would only be a question of time. But the same carbonic acid is just what the tree requires, and it absorbs it from the air, retains the carbon, and returns the life-giving oxygen. Thus, the tree performs the double service of purifying earth and air alike. These facts alone, apart from any consideration of the timber which they contain, are sufficient arguments both against the wanton destruction of isolated trees and forests, and in favor of planting trees, both for the charm which they lend the landscape, and the practical benefits which they confer upon mankind.”

There is no question of “a happy medium” in this tree-planting and tree preserving business. A judicious selection of trees that shall not so overshadow the house as to cause moss to grow upon the roof, may form the accompaniment of any farm-house without sowing the seeds of disease and consequent unhappiness. A tendency to overdo the matter under the stimulating influence of village improvement and tree-planting societies, is certainly a common observation of those who think while they look.

The planting of groves to shield farm houses and attendant buildings from the severe blasts of our climate is certainly in the interests of comfort and good health. The thick planting of rapidly growing evergreen and deciduous trees about the house, which, when attaining large size, no member of the family has the good sense to remove, is certainly a dangerous enterprise not to be too strongly censured.

Dr. W. Thornton Parker, in the *Sanitarian*, put the case in a very sensible way, and we quote parts of an article, which is very readable to the end.

He says: “For many years our people have given considerable attention to this subject of forest culture, but instead of exercising their influence in the direction of forest culture and protection where it is most needed, many seem to content themselves with planting as many trees as possible in our parks and streets and on their private grounds in our cities and towns. This love for the beauty of foliage has often been too extravagantly bestowed, and the societies formed for tree planting are not always under the direction of the wisest, and tree planting, from a sanitary point of view, has not yet received much attention. To plant as many trees as possible seems to be the only rule, and this is limited only by the means of the planter and the amount of land at his disposal.

“Where the grounds about our country houses are extensive, the luxury of shade trees can be indulged in; but healthy shade, without perfect ventilation

and circulation of air is impossible. The soil, to be fit for man to live on, must have the rays of the sun to bathe it and the fresh warm air to come in contact with it. A soil damp and overshadowed to such an extent that the sun never reaches it, is unfit for a playground for our children, or a retreat for adults; indeed, such a place is a veritable death trap for many infants and weakly persons, both in summer and winter.

"Houses overshadowed are not healthful, and too many trees near sleeping and living rooms exercise a very injurious influence. It would seem as if these truths must be too well known to need any statement, but a journey through many of our towns the past summer, and careful investigation, have convinced me that this undesirable condition of things is only too common, and has become a positive injury in almost every direction."

ARBOR-DAY.

Nebraska has the honor of originating arbor-day. Some twelve years ago, through the influence of that pioneer tree planter, ex-Gov. J. S. Morton, the Governor appointed the second Wednesday in April as the day to be devoted to economic tree-planting, and it is stated that 12,000,000 trees were planted on that day. The successive governors have continued thus to recognize this day.

The American Forestry Congress, at its 1884 session in Washington, recommended the appointment of an arbor day in all our States and the British provinces of Canada, the congress comprising many delegates from the Dominion. Prof. Northrop says:

"It may be objected to arbor day, or to any school-lessons on forestry, that the course of study is already overcrowded. I reply that the requisite talks on trees, their value and beauty, need not occupy three hours, all told. Those talks on this subject which, Superintendent Peaslee says, were the most interesting and profitable lessons the pupils of Cincinnati ever had in a single day, occupied only the morning of arbor-day, the afternoon being given to the practical work. Such talks will lead our youth to admire our forests and realize that they are the grandest products of Nature and form the finest drapery that adorns this earth in all lands. Thus taught, they will wish to plant and protect trees, whether forest, fruit, or ornamental; a pleasure that never cloy, but grows with their growth. Like grateful children, trees bring rich filial returns and compensate a thousand fold for all the care and pains they cost. This love of trees, early implanted in the school and fostered in the home, will make our youth practical arborists.

Tree-planting is fitted to give a needful lesson of forethought to the juvenile mind. Youth too often sow, only where it can quickly reap. A meagre crop soon in hand outweighs a golden harvest long in maturing. They should early learn to forecast the future as the condition of wisdom. Arboriculture is a constant discipline in foresight; it is always planting for the future, and sometimes the distant future.

FOREST STATISTICS.

The following estimates of the lumber still remaining in the pine forests, are endorsed by the highest authority:

	Feet.
Michigan	50,000,000,000
Wisconsin.....	40,000,000,000
Minnesota.....	25,000,000,000
Pennsylvania.....	7,000,000,000

Maine.....	4,000,000,000
West Virginia	7,000,000,000
Missouri.....	7,000,000,000
Arkansas.....	7,000,000,000
Tennessee.....	4,000,000,000
Mississippi	4,000,000,000
Alabama.....	2,000,000,000
Texas.....	15,000,000,000
The Carolinas, Virginia, Georgia, and Florida.....	30,000,000,000
Yellowstone Valley.....	10,000,000,000
New Mexico.....	8,000,000,000
California.....	100,000,000,000
	<hr/>
	320,000,000,000

The amount of hemlock, spruce, and hard woods of various species will probably be equal to the pine.

PEACH YELLOWS LAW, IN MICHIGAN.

SECTION 1. It shall be unlawful for any person to keep any peach, almond, apricot, or nectarine tree infected with the contagious disease known as the yellows, or to offer for sale or shipment, or to sell or ship to others, any of the fruit thereof; that both tree and fruit so infected shall be subject to destruction as public nuisances, as hereinafter provided, and no damages shall be awarded in any court in this State for entering upon premises and destroying such diseased trees and fruit, if done in accordance with the provisions of this act; and it shall be the duty of every person, as soon as he becomes aware of the existence of such disease in any tree or fruit owned by him, to forthwith destroy or cause the same to be destroyed.

SEC. 2. In any township in this State in which such contagious disease exists, or in which there is good reason to believe it exists, or danger may be justly apprehended of its introduction, as soon as such information becomes known to the township board or any member thereof, it shall be the duty of said board to appoint forthwith three competent freeholders of said township as commissioners, who shall hold office during the pleasure of said board, and such order of appointment and of revocation shall be entered at large upon the township records.

SEC. 3. It shall be the duty of said commissioners, within ten days after appointment as aforesaid, to file their acceptances of the same with the clerk of said township, and said clerk shall be *ex-officio* clerk of said board of commissioners; and he shall keep a correct record of the proceedings of said board in a book to be provided for the purpose, and shall file and preserve all papers pertaining to the duties and actions of said commissioners, or either of them, which shall be a part of the records of said township.

SEC. 4. It shall be the duty of the commissioners, or any one of them, upon or without complaint, whenever it comes to their notice that the disease known as yellows exists, or is supposed to exist, within the limits of their township, to proceed without delay to examine the trees or fruit supposed to be infected, and if the disease is found to exist, a distinguishing mark shall be placed upon the diseased trees, and the owner notified personally, or by a written notice left at his usual place of residence, or, if the owner be a non-resident, by leaving the notice with the person in charge of the trees or fruit, or the person in whose possession said trees or fruit may be. The notice shall contain a simple statement of the facts as found to exist, with an order to effectually remove and destroy, by fire or otherwise, the trees so marked and designated within ten days, Sundays excepted, from the date of the service of the notice; and in case of fruit so affected, such notice shall require the person in whose possession or control it is found to immediately destroy the same, or cause it to be done. Said notice and order to be signed by the full board of commissioners.

SEC. 5. Whenever any person shall refuse or neglect to comply with the order to remove and destroy the trees marked by the commissioners, as aforesaid, it shall become the duty of the commissioners to cause said trees to be removed and destroyed forthwith, employing all necessary aid for that purpose, the expense for such removal and destruction of trees to be a charge against the township; and for

the purpose of said removal and destruction the said commissioners, their agents, and workmen shall have the right and power to enter upon any and all premises within their township.

SEC. 6. If any owner neglects to remove and destroy, or cause to be removed and destroyed, as aforesaid, such diseased trees or fruit, after such examination and notification, and within the time hereinbefore specified, such person shall be deemed guilty of a misdemeanor, and punished by fine not exceeding one hundred dollars, or by imprisonment in the county jail not exceeding three months, or both, in the discretion of the court; and any justice of the peace of the township where such fruit is sold, shipped, or disposed of, as aforesaid, shall have jurisdiction thereof.

SEC. 7. The commissioners shall be allowed for services, under this act, two dollars for each full day and one dollar for each half day, and their other charges and disbursements, hereunder to be audited, as well as any other charges and disbursements under this act, by the township board, all of which costs, charges, expenses, and disbursements may be recovered by the township from the owner of said diseased fruit, or from the owner of the premises on which said diseased trees stood, in an action of assumpsit.

SOME NEW, GOOD THINGS IN HORTICULTURE.

Mr. J. N. Stearns, of Kalamazoo, Mich., presented the following notes:

My soil is a sandy loam, and some varieties that do well on heavy clay soil have not proved a success with me.

I have set some two and a half acres to strawberries this spring, and principally to the following four varieties: Wilson, Crescent, Mt. Vernon, and Manchester, with a few Downing, for if I was limited to one variety for all purposes, it would be Charles Downing.

The Crescent is the best early berry in our vicinity; and judging from the proportion of that variety shipped to our market from the south, it is becoming the principal berry over a large proportion of the country, although it is lacking a little in firmness. Its propensity to make plants is enormous, and to obtain the best results, it should be confined to a narrow row of plants.

The Manchester and Mt. Vernon are very late, and go well together, as the Manchester is pistillate, and Mt. Vernon staminate. These two varieties I find most profitable of any I have yet planted as they are very prolific, large, and very reliable, and Mt. Vernon especially is of good flavor, and being late, they come after the glut of the market.

Crescent, Mt. Vernon, and Manchester seem least affected with rust, or any disease, of any varieties I have in cultivation.

Of the newer varieties of the raspberry, the Tyler and Souhegan seem to be a success, being, early, hardy, very prolific, and fair size, but are so much alike in all respects, I am not yet able to discover points of difference. Shaeffer's Colossal is a great acquisition as a family berry, being wonderfully prolific, and the most hardy of any of the cap varieties. I would not advise the planting of it largely as a market berry yet, at least, until its canning qualities are better understood, as its color is against it.

The Ohio seems to be a perfect success as a black-cap, proving more hardy than the Gregg. But I doubt if we have a more profitable black-cap than the Gregg, where it can be successfully grown, its large size, and late ripening making it bring the highest price in the market. It sold in Chicago last season for \$2 a case and upwards, while varieties ripening with Mammoth Cluster and Ohio only brought from \$1 to \$1.50 per case.

Of the red varieties yet fully tested, the Cuthbert stands ahead, being hardy, of large size, firm, of bright color, and late.

The blackberries of recent introduction, that are promising the most value,

are Snyder, and Taylor. With me the Snyder is a great success, being wonderfully prolific, hardy, and to my taste, better in quality than the Kittatinny, Lawton, or Wilson. In culture, its treatment should be somewhat different from the latter, as it will stand high feeding with manure.

One of the most profitable fruits we are growing is the gooseberry, and the Downing is the best; a strong grower, extremely prolific, and of the largest size of the American varieties.

Of the newer grapes that I am testing, from my experience I can recommend but three, Worden, Moore's Early and Niagara. The Worden was not put out with the usual amount of loud trumpeting, but is steadily growing in favor, so I think it is destined to take the place of the Concord, being just as hardy, prolific, and a little earlier and better quality. Moore's Early is very similar to Concord, but ten days or two weeks earlier. Of all the white grapes I have tested or seen, the Martha and Niagara are all I could recommend; both are seedlings of the Concord, and similar in growth and leaf to the parent, and so far with me just as hardy, and free from mildew. I believe it is generally admitted that the Concord is the most profitable grape we have. I think the Niagara has all the good qualities of the Concord, being a better keeper, better shipping qualities, a little earlier and a white grape.

Mr. Stearns' paper brought out the following:

DISCUSSION.

O. Beebe, South Haven: I have at South Haven thirty plants of the Agawam blackberry two years old which fruited wonderfully this year. The berries are smaller than Snyder. The plants were in a poor location, grew very stocky, and were not at all injured by the winter.

C. W. Garfield: I saw the Agawam at the nursery grounds of Mr. Stone at Ft. Atkinson, Wisconsin, where it stood the winter better than Snyder, Taylor and Stone's. There was no snow and the canes lay close to the ground.

T. T. Lyon: Among fifteen or twenty varieties that I have been testing I have not seen any special advantage in the Agawam as regards hardiness over the average—there are a half dozen others fully as hardy. The plants being young, was probably the cause of the canes lying close to the ground, and being near the ground is a great protection, even without a covering. I have found the Agawam of good flavor and prolific.

E. H. Scott: Age makes a difference in hardiness. This year two acres of five-year-old Greggs did not yield a bushel, while younger plantings did well.

W. A. Brown: I have noticed the same with the Cuthbert, young plantations being uninjured, while those four and five years old were killed. The same is true with peach trees. The most hardy blackberry I know is Western Triumph.

J. D. Muchmore, Fremont, Ohio: I would like to know whether the Lucretia dewberry has proved hardy and valuable?

T. T. Lyon: It is hardy, as it grows upon the ground, and produced a fine crop with me this year as usual. It is not much superior to Bartel's, but the latter has produced with me but one good crop.

C. W. Garfield: I would like to inquire about the Worden grape.

O. Beebe: The Worden generally ripens ten days before Concord; this year but six. Their growth is about the same, and they are equally prolific, but Worden has larger and more compact clusters and a larger berry.

W. K. Munson, Grand Rapids: I have an acre of Worden, and have found from ten days to two weeks difference in ripening between it and Concord. This year we began picking Worden September 5th, and Concord the 22d. I consider the Worden the best black grape we grow.

J. N. Stearns: I have fruited the Worden three or four years, and this year on a few of my vines it has dropped like the Hartford.

R. D. Graham, Grand Rapids: I have had the same experience, and there seems to be no injury to the berries.

THE APPLE CURCULIO, OR GOUGER.

Mr. Willson, of Michigan, said:

"There is an orchard pest that I would like to know more about, which punctures apples, particularly the Oldenburg, early in the summer, and destroys the fruit."

Secretary Garfield: This is the apple-gouger or curculio, which, until recently, has not been very destructive to cultivated apples. Recently in Wisconsin, I have learned that in Oldenburg orchards it has proved a great pest. The insect is smaller than the plum weevil, of brownish color, and has little warty places on its wing covers. It punctures the small apples perhaps a tenth of an inch, and the egg is laid in the bottom of the cavity. The larva, when it is hatched, feeds at the core of the fruit. It takes about a month to attain its full size, and two or three weeks more it remains in the pupa state, when it eats its way out of the fruit a perfect insect. The insect not only punctures the fruit for the purpose of making a place in which to lay its eggs, but it gouges holes in the fruit while eating. It is a very difficult fellow to fight. Probably no better way is known than the methods pursued with the plum weevil.

TWELVE GOOD INTRODUCED SHRUBS.

By PRESIDENT T. T. LYON, OF MICHIGAN.

Supposing this to be intended to invite a list of shrubs for the open ground, which must, therefore, be hardy enough for the climate of our State, and also inferring that deciduous flowering shrubs are intended, observing, also, that climbers are included elsewhere in our programme, we find our field a somewhat limited one.

We have also aimed to avoid those very new, and, hence untried and expensive; and we have also passed by such as have objectionable peculiarities, such as a tendency to sprout, or those of a semi-biennial habit.

We refer to each as nearly as may be in the order of its blooming.

Forsythia viridissima comes to us from the north of China. It is one of the earliest of our spring flowering shrubs, and is often completely covered, in early spring, with tufts of large, pendulous, bright yellow flowers. Although called hardy, it will be safer to sheath it up with straw or give it the protection of a box during winter, to insure against loss of the bloom.

Cydonia Japonica—The Flowering Quince—is an introduction from Japan. We observe that the professor of horticulture at the Agricultural College speaks of it as not entirely hardy, but we have known it long and extensively in Michigan, and have never known a case of injury from winter cold. It is a very early and profuse bloomer, with large, crimson or scarlet flowers, and when of mature age, it often fruits very profusely. It also makes a beautiful, rather low, ornamental hedge or screen.

Exochorda grandiflora, sometimes known as *spirea grandiflora*, is a beautiful, hardy shrub, introduced a few years since from China. It is large, for a shrub, with lance-shaped leaves, and the stems terminated by racemes of handsome white flowers. It is somewhat difficult of propagation, and hence rare.

Syringa Persica, Persian Lilac, is, as its name indicates, an old introduction from Persia.

Many of the lilacs have a very objectionable as well as inveterate tendency to sprout, hence we pass them by in favor of this one, which is free from such tendency,

and is, moreover, very floriferous and of more slender and lower habit, although abundantly vigorous.

Deutzia crenata fl. pl.—Double Flowering Deutzia—is one of a family introduced from Japan. Its small, double flowers have the petals red without and white within, and are borne in dense clusters or racemes on and near the ends of the branches. A severe winter occasionally injures the young shoots, causing material loss of bloom.

Deutzia gracilis, also from Japan, is of much smaller growth than the preceding, with single white flowers, which are produced in great profusion. It is much employed by florists for forcing for winter cut flowers.

Weigela rosea is the original variety introduced by Mr. Fortune from China and Japan in 1843, and is the one best known, although some of the more recent varieties are claimed to be finer. Very strangely, it seems not to have yet been favored with a common name.

Viburnum plicatum—Japan Snowball—comes from Japan, although several species are natives of America, Europe, and Asia. The common snowball, or guelder rose, is well known and desirable, but *plicatum* is believed to be the finest of the species.

Rhus cotinus—Smoke Tree, Purple Fringe,—a native of Southern Europe, is well and favorably known. It is generally hardy in our State, although the shoots on young plants are sometimes injured by severe cold.

Spiraea Douglassi is named as one of the most desirable of a very numerous family, although it has several rivals. It is an introduction from Japan, although Europe and America are by no means without native representatives of the family.

Hibiscus Syriacus—Althea, Rose of Sharon—is a native of Syria, but has been long and favorably known in our country. It blooms very freely, and is usually called hardy; although its habit is to continue its growth and bloom too late in autumn, and, doubtless for that reason, in our climate, it is often more or less injured in winter, although, with cutting back in spring, it seldom fails of bloom.

Hydrangea paniculata grandiflora, often called New Hardy Hydrangea, is a comparatively recent introduction from Japan. Its very large, white clusters of bloom, borne one at the terminus of each branch, are very showy, though rather coarse. They last a long time, but soon become shaded with dull, brick red, and are then less attractive. Unless the soil is rich, deep, and well cultivated, the clusters of bloom are liable, especially in case of hot, dry weather, to become small, imperfect, and unsightly; but these difficulties may be easily avoided by manures, cultivation, and watering, which, at this late season, when flowers have ceased to be plentiful, will yield very pleasant returns. It continues in bloom till frost, and is entirely hardy.

The above list will generally afford a continuous succession of bloom from about the beginning of May till October

NEW FRUITS IN MICHIGAN.

The Committee on New Fruits, by President T. T. Lyon, Chairman, made a report, from which we extract, as follows:

" On September 8, 1884, specimens of an apple, known locally as *Morton*, were received from Albert James, of Benton Harbor, Berrien county. Fruit of medium size, roundish oblate; the surface nearly covered and obscurely striped or splashed with two shades of red on a pale-yellow ground; dots few, small, golden yellow; basin narrow, abrupt, plaited; calyx small, closed; cavity medium; stem rather short; texture crisp, breaking, tender, moderately juicy perfumed; rich sub-acid, sprightly, excellent, very good. As beautiful as the finest Red Astrachan, and a far better dessert fruit. Season said to be from the first to the tenth of September.

Fruit of a seedling-cherry, which the originator proposed to call Michigan Beauty, but which, in compliance with pomological rules, we designate as simply *Michigan*, were received on July 8, 1884, from Stephen Cook, of Benton Harbor, Berrien county. It is claimed to be nearly rot-proof, and the tree hardy and vigorous; in habit, much like Black Tartarian. It is supposed to be a cross between this and Bigarreau (Yellow Spanish), which is its parent. Fruit large, long heart shape; color dark red, nearly black; texture very firm; juicy, sweet, or very mild vinous; free, an early and good bearer. It will, doubtless, prove a good market cherry.

Centennial is a seedling of Napoleon, which first fruited in 1876, originated by Henry Chapman, of Napa Valley, California. Specimens of the fruit were mailed

to us on June 1, 1885, from that place, by Coats & Tool, and arrived in fine condition on the 6th. Fruit very large, obtuse, heart shape, pale yellow, specked and dappled with dark red, much compressed; very firm, even more so than Napoleon; sweet, with the usual Bigarreau flavor. Worthy of extensive trial as a market cherry.

Downing is a new grape, originating with J. G. Burrow, of Fishkill, New York. Specimens of the fruit were received from him on November 7, 1884. Said to have been ripe September 20, and to keep until spring. Cluster long, compact, not shouldered; berry very large, oval, dark purple, nearly black; bloom rather dense, bluish; skin thick, slightly astringent; pulp tender, breaking; flavor mild, vinous; berries cling tightly to the peduncle. Will evidently prove valuable as a market and keeping grape, should the vine prove satisfactory.

Unnamed Seedling.—Fruit of a new seedling-grape was received from Ottawa county on October 2, 1885. It is of the *Labrusca* class, evidently very hardy, and this year, when mildew has been prevalent, its foliage has apparently been free from disease. The bunch is of medium size, short, compact, not shouldered; berry medium, round, reddish amber, with a thin, whitish bloom; flesh and juice nearly colorless; pulp tender, breaking; flavor vinous, sprightly, with little if any astringency; very good. Season about with Delaware. Should it improve, as is usually the case, upon further fruiting, it seems likely to prove valuable.

Lothrop's No. 1, a pear, originating in West Medford, Mass., from seed sown in 1863, was noticed three or more years since in the *Gardener's Monthly*, by the editor, and was, also, two years since, examined and reported upon at the Philadelphia meeting of the American Pomological Society. We received specimens from the originator, picked on September 13th last, which we examined on the 24th of that month, in perfect condition, and which more than sustained the character previously given it. Fruit large, obovate pyriform, yellow, much russeted, with occasionally a faint crimson cheek. We regard it as valuable as a dessert, and, also, if productive, as a market year.

Weaver, is a plum of the *Chicasa* class of American varieties, which has been grown to some extent in the upper Mississippi Valley, and prized for its great hardness. Fruit medium, roundish, tapering toward the apex, and a good deal compressed. Yellow, dotted and shaded with purplish red, often over the entire surface; dots many, purplish, varying in size; bloom very slight; texture very firm; flavor mild sub-acid, sprightly, not rich. Free-stone. The skin is thick, tough, and astringent, about fourth or fifth-rate in quality. Tree, as grown here for years, bloomed freely, but failed to fruit. Holds its foliage perfectly, and never suffers from cold.

Michigan Early is a raspberry reputed to have originated in Michigan, although introduced to the public at the East. We have now grown and observed it for the past two seasons, but have, so far, failed to develop either size, quality, or productiveness.

Surprise comes to us without a history, and during a two years' trial, has developed some useful qualities. Plant vigorous and productive; fruit large, to very large, roundish, slightly conical, dark red, with a slight bloom; texture rather soft; flavor sprightly, pleasant acid, rather dark in color, but promising, even for the market.

STRAWBERRIES.

Jewell, which is now being introduced by the originators—P. M. Augur & Sons, of Middlefield, Conn.,—is, doubtless, one of the most valuable market varieties recently brought before the public. Plants sent us in the spring of 1884, in advance of its introduction, bore a very heavy crop the past season. Fruit very large, bright, glossy crimson, mild acid, firm. It holds its size well through the season, and, although not of high quality, it compares favorably, in this respect, with our popular market varieties. The plant, also, is vigorous and hardy. Pistillate.

Atlantic is a New Jersey seedling, found growing wild in that State. We planted it in the spring of 1884, and it came through the last very trying winter in fair condition. Fruit, in form, somewhat like Bidwell, though hardly as large or as bright in color. It seems likely to win a medium position as a market berry. Bi-sexual.

Jumbo (another eye-opening name), is Cumberland in all its peculiarities, whether of plant or fruit. Doubtless a re-introduction of that variety under a sensational name. Bi-sexual.

Parry.—Potted plants of this were sent us by the originator, late in August, 1884, in advance of its public dissemination, which, during the past season, have fruited freely. Fruit of the largest size, roundish conical, light crimson, rather firm. It seems to hold its size well in the later pickings. In quality, it is among the best of

the large varieties. The plant is vigorous, and so far promises to be productive, but of this we can not yet feel certain. Season medium, June 19, 1885. Bi-sexual.

Cornelia, a selected seedling of M. Crawford, of Ohio, was sent for trial in the spring of 1884. The plant spots somewhat in the sun; is moderately vigorous, and bears a fine crop of very large, broadly conical berries dark scarlet in color, and very late; texture firm, moderately juicy, and pleasant sub-acid in flavor. A promising berry for late marketing. Much of the crop matured as late as July 7th. Pistillate.

Prince of Berries is one of the originations of that indefatigable experimenter, Mr. E. W. Durand, of New Jersey, who, we regret to observe, seems somewhat inclined to indulge, as in this case, in the use of inflated names. His processes include high and thorough culture; and, so far as we recollect, none of his varieties, so far, have proved valuable, in the absence of this, to which this variety does not prove an exception. Fruit large, roundish, necked; color light red or scarlet; texture firm; moderately juicy, mild, rich sub-acid. One of the very finest of the large straw-berries, but will only produce satisfactory crops under high cultivation in hills. Season, June 27, 1885. Bi-sexual.

Crawford's No. 6 was sent for trial, and planted in the spring of 1884. The plant is much like the *Cornelia*, but somewhat less vigorous. It bears heavily. Fruit medium to large, conical, much rounded, dark scarlet, very firm, juicy, sub-acid. Its value will depend upon the health and productiveness of the plant, of which we are yet uncertain. Pistillate.

THE STATE HORTICULTURAL SOCIETY OF PENNSYLVANIA

Held its last session at Lancaster, Pennsylvania, January 21st and 22d. We make a few extracts of general interest from the report, kindly sent by the Secretary, E. B. Engle, of Waynesboro, Pennsylvania:

SITUATIONS FOR APPLE ORCHARDS.

Mr. Hiller: I have been urging, for several years, the advantages of a low situation for apple orchards, and I now wish to call attention to some specimens grown on such a location. I have here a Baldwin, grown about ten feet from a small rivulet, which is not over eighteen inches below the level of the surrounding soil, and held its fruit well; and the only difficulty in keeping them, was to keep them from being eaten. Some of the same variety, grown on high ground, were inferior in size and keeping qualities, and every specimen gone by October 1st. So, also, with Smoke-house; those grown on low ground kept well until April, while those from high ground did not keep at all. York Imperial on the hill-top were knotty and fell early. Dominion, on brick-clay soil, were good; on high, gravelly ground, poor and imperfect. I only wish to show how these apples keep when grown on low, damp soils, and that finer fruit can be grown, and with more certainty than on high ground.

Mr. Balderston: There are, doubtless, other reasons for these facts, as reported by Mr. Hiller. I spent some time recently in Western New York, and noticed that apple trees were pruned back to a uniform height; that they bore immense crops of fruit, which kept well. I think they are usually gathered before fully ripe, and, while they keep better, they lack quality and flavor. It may be more profitable to grow them in this manner, but I would prefer to eat the fruit from high or upland ground.

APPLES.

The reports from the eastern section of the State show that there was a very large crop of this valuable fruit, and the quality was quite fair. Throughout Central Pennsylvania and the mountain districts of the State, the yield was comparatively meager, and the fruit was of inferior quality, having been damaged by late spring frosts. In the western portion of the State the crop was a failure in many respects, owing to frosts in early summer and protracted drought in the latter part of the season.

PEACH YELLOWS.

The cause of "yellows" remains as great a mystery as ever, but a majority of the correspondents agree that the best cure is to pull out the trees that are affected and destroy them. The climatic theory is entitled to much weight, especially as it is known that there are sections of the United States where the disease has never appeared.

GRAPES.

The reports in regard to grapes differ materially, there having been a very good crop in some counties, while in other sections the crop was a failure. There is considerable complaint of uneven ripening, while the cause of failure is assigned principally to rot and mildew. On the favored hillsides, in the vicinity of Pittsburgh, the crop was large and excellent, although late in maturing. The reports agree that of the numerous varieties of recent introduction there are very few worth retaining, and the Concord maintains its pre-eminence as the most desirable variety in existence for general purposes. The experience of correspondent Thomas M. Harvey, of Chester county, whose collection embraces over one hundred and fifty varieties, is that the Concord is worth more than all the rest. Among the more promising of the newer varieties, he mentions the Brighton, Duchess, Pocklington, Moore's Early, and Niagara. The reports concerning the Brighton are uniformly good. The experience with the Niagara is not sufficient to warrant any definite conclusions.

SMALL FRUITS.

The crop of small fruits was up to the average, and the prices, as a rule, compensated the growers amply.

There was a large crop of strawberries, except in a few localities, and the Sharpless, Charles Downing, Cumberland, and Crescent Seedling are the varieties most prominently mentioned. Mr. Satterthwaite, who, owing to his nearness to the Philadelphia markets, is well qualified to judge of the wants of growers, places his main reliance upon the Mt. Vernon. J. S. Keller, of Orwigsburg, claims that his new variety, "Keller's Seedling," bore every month during the summer and fall, and was less affected by drought than the older sorts. An improvement is wanted in raspberries. The Cuthbert is highly spoken of by several correspondents. Very little attention is given to blackberries, currants, and gooseberries. Those who grow blackberries for market find them to be one of the most profitable crops that can be raised.

LIST OF FRUITS FOR FAMILY AND MARKET.

As to varieties, it is not well to run too many kinds, if profit is to be the measure of success. The most successful fruit-growers of Berks county, Messrs. Christopher and Solomon Shearer, have comparatively few varieties of each kind of fruit. They are brothers, and the latter has nearly five hundred acres at Vinemont devoted to fruit. Being asked to furnish a list of the best varieties of fruit, for both family and market purposes, he gave the following as a result of many years' experience:

Apples.—Red Astrachan for summer, Alexander and Porter for autumn, and Baldwin, Hubbardston's Nonsuch, Jonathan, and Winesap for winter.

Pears.—Bartlett for summer, Seckel for autumn, Beurre d'Anjou for late autumn, and Dana's Hovey for winter.

Cherries.—Belle de Choisy and May Duke.

Peach.—Crawford's Early, Crawford's Late, Early Rivers, Foster, and Old Mixon Free.

Grapes.—Worden.

Of the berry fruits he recommends the following:

Strawberries—Sharpless, Crescent Seedling, Charles Downing, Cumberland Triumph, and Miner's Prolific.

Raspberries.—Brandywine, Cuthbert, Doolittle, and Gregg.

Blackberries.—Kittatinny.

At a discussion at one of the monthly meetings of the Berks County Agricultural Society, the different varieties, advocated as being worthy of recognition, comprised only thirteen of apples, seven of pears, and ten of peaches. Of several hundred varieties of grapes, the Hon. Marshall P. Wilder, who has made a specialty of the subject for many years, is reported as having expressed himself in favor of only the following kinds as possessing valuable characteristics: Moore's Early, Worden, and Early Victor as early varieties; Concord, Delaware, Brighton, Barry, Lindley, and Wilder as well established varieties, and Martha, Lady, Prentiss, and Pocklington as white varieties. The venerable Charles Downing, who has for years been recognized as the leading authority on pomology, has pronounced in favor of Fanny as the best summer apple; the Fall Pippin as the most desirable fall apple for all purposes; and Hubbardston's Nonsuch as the most perfect apple of its season. He also recommends the Bartlett as the best summer pear for general use. Beurre Bosc for fall, and Dana's Hovey for winter.

POTATOES—BEST VARIETIES, AND HOW TO GROW THEM.

BY A. W. HARRISON.

I did not expect to be called upon, but as you have asked for my views, I will give a few items of my personal experience. In 1863, I took charge of a small place of nineteen acres, twelve of which were arable. Classically speaking, I was then a "horticus," not a "rusticus." It was a starved out, worn-out place, and I hired with a view to improve it as a dwelling and a home. Being a beginner, I apprenticed myself to myself, planted the ground in sundry crops, from which I realized the first year eighteen hundred dollars. The next year I was a journeyman in the business, and my sales amounted to twenty-seven hundred dollars. The following year I was "boss," and sold from the same ground, sixty-one hundred dollars worth of potatoes of twenty-one varieties. They were manured with a special potato fertilizer, and grown on a different method from that usually pursued. I would say just here that I have no faith in chemical analysis of soils, as usually recommended for farmers. They have no practical value, because, even if the necessary elements are present in the soil, they may be in such an elementary condition that they cannot be utilized by the growing crop. I would feed plants on the principle that "like produces like." If I were buying a fertilizer for pear trees, I would pay the highest price for ashes of that particular wood. Any ashes would be good, but pear ashes would be best for pear trees.

The little farm which I had taken charge of, had been manured for fifteen to twenty years, but as I desired a special fertilizer for potatoes, I obtained several analyses of the entire potato plant, and then prepared a special compost for such crop. I bought six hundred bushels wood ashes, added twenty bushels finely-ground bone, and a liberal supply of oyster-shell lime. Having prepared the best form of fertilizer for the purpose, I selected medium sized,

perfect potatoes, plowed deeply, planted them whole, three feet apart each way, putting a handful of fertilizer at each hill, and kept the entire twelve acres as clean as a garden. The vines made a remarkable growth, sometimes lapping over each other as much as eighteen inches. Three hills failed, probably owing to moles and field mice, but, notwithstanding this, I had two thousand eight hundred and eleven bushels of marketable potatoes. Had I planted all of varieties that I knew yielded best, I would have had over three thousand six hundred bushels. Flat culture is best. The hilling system is borrowed from England, and is not adapted to this country. Continual cultivation is essential. One hill in the aforementioned crop had thirty-one full sized potatoes. Rot was bad that season, and the crop was stored in the house and barn cellars. I sprinkled all with air-slaked lime, and in spring had about two baskets of unsound potatoes. Mr. Nicols, of the *Boston Journal of Chemistry*, who is a practical agriculturist, and makes a thorough test of fertilizers before recommending them to his readers, says that of all potash fertilizers he ever used, there is none so near perfect as hard wood ashes. Nitrogen and other artificial fertilizers are over-estimated. Have never tried "kainit," but think it is also rated far above its real value.

MR. HILLER said: Among the scores of varieties tried, the White Elephant stands unrivaled in quality and productiveness combined. I might say that, in my experience, commercial fertilizers are better than barn-yard manure for potatoes. Any of the complete fertilizers, viz, those that contain potash, phosphoric acid, and nitrogen answer a good purpose. I have been using a mixture of four hundred pounds of sulphate of potash, four hundred pounds of acid South Carolina Rock, and two hundred pounds of nitrate of soda. Of this mixture, I apply from six hundred to eight hundred pounds per acre. I have raised, by this process, from three hundred to four hundred bushels per acre.

The following remarks were made by W. K. Moon, of Morrisville, upon

THE ADORNMENT OF RURAL HOMES.

The expenditure of a small amount of money in the purchase of ornamental trees, shrubs, roses, and climbing plants, and their proper arrangement, so as to produce the needful shade, and, at the same time, to hide any unsightly objects from view, will well repay for this investment. Donald G. Mitchell, in his work entitled "Out-of-Town Places," says the true art of landscape gardening lies in such disposition of roadways, plantations, walks, and buildings as shall most effectively develop all the natural beauties of the land under treatment, without conflicting with the uses to which lands may be devoted. And further, he says: "It comes within the domain of the landscape art to secure an agreeable lookout from the cherished windows of the country homestead, whatever may be its situation. Accident or choice of site may, indeed, secure this beyond question, but site being established where views are limited, or obnoxious objects fret the eye, it is surprising what may be done by judicious planting."

Many farmers look upon ground devoted to a lawn or yard as little better than wasted, and feel that they can ill afford to set aside half an acre or more around their dwelling, in which they may, in all probability, spend the remainder of their lives. They count the loss thus sustained, by the number of bushels of corn, oats, or potatoes, that said land would yield annually. But, too often, I fear, these same farmers neglect to count the land wasted in impoverished rockeries, covered with dewberry and poison vines, unsightly fence corners, or hedges of sumac and elder that, in all probability, infest their

farms. Have your yard and dispense with these unsightly objects, and your farm will be quite as profitable and far more attractive. There is something pleasant about a rural home that has been laid out and planted with some degree of taste and propriety. Though the buildings may be nothing more than ordinary, yet if there has been a nice interspersing of evergreens and deciduous trees in a manner that will break the winter's blasts from coming with undiminished violence against the dwellings, and a further adornment by shrubbery and hedges, there is something about such a home that will exert an influence on the younger generation, and may be the means of causing them to form a preference for a country life, instead of seeking their fortunes in the large cities. Surely, the remunerative prices these farms, with attractive farm buildings and pleasant surroundings bring, when placed on the market, should be an incentive to try to make our own so. When we couple with this the satisfaction there is in having one's lot cast in pleasant places, and one's family gathered around, as it were, beneath one's own vine and fig tree, there is that indescribable satisfaction and happiness which cannot be measured by mere dollars and cents, but will go far toward compensating for the outlay necessary for the "Horticultural Adornment of Our Rural Homes."

MR. THOMAS MEEHAN said: Where I see a farmer who has no love for the beautiful, for flowers, for home comforts, and pleasant surroundings, I usually find no happiness, and unworthy members of society. I will not say that such are always the inevitable results, but the tendencies are in that direction. We should make happy homes and pleasant surroundings one of the objects of life, because it is not so much what we make, but how we spend it, that brings happiness.

MR. WITMER.—Many of us would be glad to ornament, if we knew how to make proper selections and care for them when planted.

MR. ELY.—I think many make a mistake in planting untried, expensive novelties, and paying too little attention to our native trees and flowers. What is so attractive and so easily grown as our arbutus, columbine, and other native flowers? Many of them are more easily cultivated, and more desirable than the most costly imported flowers, and will give greater satisfaction. I hope they will not be forgotten.

MR. MEEHAN.—Years ago, Mr. Buist told me some of his experience. A lady was admiring some handsome flowers he had in pots, and was offering for sale. He asked seventy-five cents for the plant, told her it was one of the most beautiful American cowslips, and was much admired. After discovering that it was a native plant instead of an exotic, it lost all interest for her, and she refused to take it. But a plant need not be an exotic to be beautiful. Nearly all our best and most desirable plants are natives, and we need not go to the florist or nurseryman to get beauty, if our means are limited. Our meadows, forests, and fields have beautiful plants in abundance, and we will be surprised at their increased beauty and attractiveness when domesticated and cultivated. We can begin with plants from the woods and fields, and as our tastes and experiences grow, we can try the rare things that require more care and attention, and some money to buy. I often feel sorry that so many depend wholly, in their beginnings, on the nurseryman and florist. They plant Norway spruce and soft maple, while they can get prettier trees, and as much variety, in our forests. There are many varieties of maple, and twenty to thirty of oak. Very few really know the value and beauty of the oak as an ornamental tree, and any, except the white oak, will grow faster than horse chestnut. I wish to call attention to another point referred to by the essayist. Trees do not exclude the circulation of air from our houses. Owing to the difference of temperature, there is more circulation of air about a building well

shaded and surrounded by trees. In conclusion, I might add that home adornment is cheap and easily accomplished, and where nature furnishes so many facilities, and where the beautiful is so easily attained, why should we fail to have pleasant and attractive homes?

CANNING OR EVAPORATING FRUIT—WHICH IS PREFERABLE?

MR. BALDERSTON.—The question of fruit-evaporating is an important one, and will be worthy our consideration. It has many advantages over canning, as it does not change the flavor or excellence of the fruit, especially apples. It is also more economical, as it involves no outlay for expensive glass jars nor even the cheaper, but more objectionable, tin cans. In evaporating fruit, it would be very desirable to have each variety dried, packed, and labeled separately with the name of the producer. This and other similar societies can aid materially in having this accomplished. One great objection to canning in tin, is the danger of acid poisoning.

MR. DAVIS. I am told that the chief danger is after opening tin cans and exposing the fruit to the air.

DR. RYDER.—When I first commenced canning, years ago, glass was expensive and tin was chiefly used. Glass is cheaper now, and we have not used tin for ten years. Evaporating has many advantages over canning, and one of the most important is the comparatively small bulk it occupies, and the ease with which it is transported from place to place. Red raspberries seem to lose quality and flavor by evaporating, but black raspberries, apples, peaches, etc., if well ripened and properly evaporated, are preferable to the canned article. I think the idea advanced by Mr. Balderston in reference to keeping varieties separate is an excellent one, and I have advocated it for years. It is hardly practicable, except in large orchards containing not many varieties. Bleaching seems necessary to realize best prices for fruit, but it is carried to excess by many, and at the expense of flavor and quality. I believe a reaction is taking place, and that there will be less bleaching with sulphur in the future. Last fall, Mr. Downing requested me to send him some fine evaporated fruit not bleached with sulphur, and I had great difficulty in obtaining it. Years ago we knew nothing of bleaching, simply drying the fruit quickly without sulphur.

PRESIDENT STITZEL.—What varieties are best for evaporating?

DR. RYDER.—Almost any good cooking or baking apple will evaporate nicely, "Maiden's Blush," "Smoke-house," "Ewalt," "Domine," "Porter," and "Rambo" are good. "Fallawater" is too coarse grained.

GRAPE ROT—WHAT IS THE CAUSE AND REMEDY? WHICH IS THE BEST WHITE GRAPE FOR GENERAL CULTIVATION?

MR. DAVIS.—This question was submitted by me, and I hope it will elicit some discussion. In Juniata county, we can hardly grow grapes on account of rot. They do not get soft and mushy, but dry up when about two-thirds grown. I saw a statement recently, that it was caused by fungus, and that, after the fruit drops, the spores or seeds remain in the ground until the following season. The remedy proposed was to gather up all the fruit as it falls and remove or burn it.

MR. MEEHAN.—It is, no doubt, caused by fungus, and there must be some favorable conditions for its development, probably too much wet or moisture. It has been proven that covering the fruit with paper bags is a preventive, and a party in Ohio who thus protects his grapes never has any rot. He employs fifteen to twenty girls, and finds that it pays. In a general way, also, it best to pay attention to the health of the vines by proper cultivation and pruning, and there will be little trouble with rot.

MR. MOON.—This question was discussed at the last meeting of the New Jersey Horticultural Society, and covering the grapes with paper bags was strongly recommended. It was stated that bags cost one dollar and a quarter per thousand, and the cost of putting them on was about the same. It is the best means of protection against rot, insects, and birds.

PRESIDENT STITZEL.—These statements agree with what Dr. Calder told us at Harrisburg several years ago. At first the bags were tied with strings, but afterward pins were found to be preferable. A careful estimate was made, and, after counting the cost of bags, pins, and labor, it was found to pay.

MR. ENGLE.—There is no question as to its utility, and it is surprising how early it can be done to advantage. If postponed too long, they may be injured by insects or the germs of disease may already be developed. There is some advantage in the kind of bags used. I had some made to order, with a "flap" on one side to lap over the other and keep out rain. Bags are also valuable in keeping grapes after ripening, as they will remain in good condition for a long time by being laid away in the bags in which they ripen.

MR. CHASE.—As to the best white grape, I know none that can be recommended for general cultivation in this State. Pocklington, Niagara, and Empire State are fine, and do well in certain localities, but should be tested before planting extensively.

D. E. LONGSDORF.—Can Catawba be ripened and kept by bagging? It does not ripen any more in our locality.

MR. HEPLER.—I grew Concord and Catawba side by side, and cut some fine fruit second Monday in October. They were not protected by bagging, and I had no sign of rot.

PRESIDENT STITZEL: I was one of the first to use paper bags on grapes, in our locality, and did so, in the first place, on account of bees. Have probably twenty-five varieties, and "bagged" all, even Clinton, which we often leave on the vine until winter. I generally select only the finest bunches, and think the grapes thus protected are worth fully fifty per cent. more. The fruit is apt to be injured in putting on the bags, and not less than two-pound size should be used.

MR. HOOPES: We find it necessary to bag all our grapes to secure from rot. The bunches are also more perfect, and the fruit delicious in flavor.

THE APPLE TREE BORER.

MR. SATTERTHWAITE, who prepared an interesting and useful paper upon this subject, said: "Scarcely one farmer in ten who grows apples, and suffers from its depredations, has ever seen the parent beetle that produces the apple tree worm; and what is worse, very many have no idea that there is such a thing, and really have no idea how the worms get into the apple.

"For the benefit of these, it seems proper to say that this insect is a peculiar-looking striped beetle, from three-quarters to seven-eighths of an inch in length, which emerges from the tree generally in the month of June, some-

times later, but always during the summer months, probably never later than July. Though a peculiar-looking and easily recognized insect from its rather bright brown and white stripes, it is very seldom seen, even where most numerous, from its habit of flying only at night, and keeping itself secreted through the day. The very few that I have ever seen, I have found just ready to emerge from their hole in the tree. This beetle deposits its eggs in the bark of the tree, generally near the surface of the ground, during the summer months. The egg thus laid soon hatches into a worm, which immediately commences business by eating through the bark, and working its way downwards, sometimes circling round, so that two or three or more in a small tree will often completely girdle and kill it the first season. As it is probable that every female beetle lays from two to three hundred eggs, laying from one to four or five in a tree, it can be easily seen how soon a whole orchard may be destroyed by them, if nothing is done to prevent it. But fortunately the remedy is so simple and easy that it can do no serious mischief except by the most inexcusable carelessness. All that is required is to take out the worm with the point of a knife, early in the season, or before it has eaten far. The slight wound then made will soon heal at that season of the year, without harming the tree. It is generally not difficult to see at a glance, from the discoloration of the bark and the dirt worked out, where there is a worm at work. The time to do this is early in the fall, and, as it is very important to make thorough work and not allow one to escape, once going over is not sufficient.

I make it a rule to examine my trees three times between August and November. This is necessary, because the eggs of this insect are not all deposited, as some suppose, early in the summer, but are continued for two or three months, the first worms showing themselves early in August, but some not until two months later, and those first hatched would have done much mischief if left till that time. It is much better to examine your trees both early and late; by so doing, much more effectual work will be done, as some that may be missed the first time will be more easily seen later in the season.

To facilitate this work, and make it in fact a very simple and easy task, instead of a troublesome, laborious, and unsatisfactory one, it is only necessary, just before the time when the insect begins to deposit its eggs—about the 1st of June—to bank up the earth around the trunk of the tree from half a foot to a foot in height. The egg of the borer will then be laid so far up the trunk that the worm is easily seen and removed; but if this is not done, the egg will be deposited so low down that they will be much more difficult to see and take out, and very soon get so far down among the roots as to make it almost impossible to get at them. In a cultivated orchard, this hilling is done with a shovel, but if in sod, sand or ashes may be hauled and placed around the tree; a few shovelfuls to each will be sufficient. When trees have been attended to in this way, it is not more than a day's work to go over an orchard of a thousand trees, take out the worms, and do the work effectually, and even if a few should escape, they can easily be seen and taken out afterwards, as the mound around the tree settles down with the weather, when without this, they would be down among the roots and certainly escape.

Many things have been recommended for washing or coating the trunks of fruit trees to keep out the borer, and very many have been swindled by venders of patent nostrums to prevent worms from destroying their trees. All these washes are humbugs, so far as keeping out the borer is concerned, and no application of the kind to the trunk of the tree will keep out the borer, but what would be very injurious to the tree, and the only effect would be, as in the case of the paper, to cause the insect to lay its eggs higher up in the tree. It may be well to say here, that where this insect is bad, it does frequently deposit its eggs in the forks and among the branches of large trees, and to make thorough

work of getting rid of them, it will be necessary to look after these ; from the peculiar dirt they make dropping to the ground, they may be easily discovered.

Besides the apple, this same insect (*Saperda bivittata*) attacks the quince, and the hawthorn, and mountain ash. It is much worse in the quince than in the apple, and I find it requires more care in looking after them, as the young worms seem to get deeper into the wood, and their workings do not show so plainly on the surface as they do in the apple. It also requires good eyesight to always detect them.

Having said all that seems necessary to say in answer to the question, "How to prevent the ravages of the apple-tree borer?" I might stop here, but, as there are many still who find they have to deal with it in the late stages of its growth, it will perhaps be well to pursue its history further. If not destroyed in its early stages, as should always be done, it goes on eating further in and working its way downwards, fast increasing in size and eating more rapidly as it grows, until it attains the size of about an inch in length. It then commences to burrow further into the tree and turn its direction upwards. It continues in this course a long while, making generally a straight hole in an upward direction, about half an inch from the outside of the tree, and working its chips behind it, leaving a hole almost as straight and smooth as could be made with a gimlet, from half a foot to a foot or more in length. After working in this course for a year or more, and the time approaching for it to make the great change of its life-time, it begins to turn its attention to the outside world, and eats itself a hole straight through to the outer bark, leaving but a thin film of this to screen it from the gaze of impertinent outsiders. It has now attained its full size, about one and one-quarter inches long, of a yellowish cast, much the thickest at the head and tapering to the outer extremity. Having now about completed this stage of its existence, and made every preparation for its exit from its long imprisonment, it rests quietly in the hole it has prepared, with its head at the opening, and undergoing the wonderful change which transforms it from a very ugly-looking worm to a rather comely-looking beetle, in which shape it comes forth to enjoy its brief period of a few weeks of freedom, and then lays its eggs and dies.

The regular period of the apple-borer in the tree is two years, though it is said to sometimes remain for three years. If not taken out the first season, it will be much more difficult to get at it and destroy it after that. A wire will then be useful in probing for it, and sometimes even a chisel and mallet will become necessary. But if thorough care is taken to have all your apple and quince trees banked up about the 1st of June, as directed, and they are attended to by going over carefully three times, at intervals of about a month, in the late summer and autumn, there need not one escape, and unless you have near neighbors that are careless, you need have but little trouble with the borer.

FRUITS AND FLOWERS.

Professor Thomas Meehan, of Philadelphia, delivered an interesting oral address upon "Fruits and Flowers in Connection with the Progress of Civilization, from which we make a few extracts :

Mr. Charles Downing, whose death has just been announced, was a remarkable example of one who devoted his life wholly for the benefit of others. Almost daily, baskets of fruits and flowers were sent to him, on which he cheerfully paid charges, so that he could examine and classify them for the information of others. He never failed to answer his correspondents, and, though much labor and time were involved, he did so without pecuniary re-

ward. In a recent letter, he informed me that he never made a dollar out of his valuable publications, but he sent his manuscript to the publishers, merely stipulating that he be given a few copies of the printed works for distribution among his friends. He was the embodiment of all that is good and noble in man, and horticultural pursuits, no doubt, had a moulding influence in the formation of his character.

Dr. Gray, the noted botanist, said he could tell a man's nationality all over the world by the weeds that surrounded him. If every white man were swept out of existence to-day, the botanist could tell by the fruits and flowers surrounding him that he had been here, and where he came from. Thus I might go on for hours and give illustrations of the important part fruits and flowers have had in the civilization of all ages; but, to come nearer home, let us look at their influence in the settlement of new countries. Though gold, silver, and other minerals may often induce settlers, it is really the adaptation and capacity of the soil to produce fruits, vegetables, and flowers that exert the greatest influence. Take, for instance, California. Although gold and silver were the first inducements to settlers, the cultivation of fruits and vegetables has done far more to develop her wealth and resources, and induce immigration, than her mines. So Florida, with her oranges and lemons. How many hundreds have been lured there to cultivate them, and with that cultivation came wealth and civilization. And the great North-west, with her wheat and grazing lands—these are the influences which tend to their settlement and development.

My chief object has been to show what influence flowers have, and how much depends upon the love of flowers and horticulture in general. Two years ago, when in the North-West, I went among the Indians in Alaska, and, though warned not to go among a certain tribe, I found among them Captain Crittenden, of Kentucky, who, after the collapse of the Southern Confederacy, went to Alaska, and has ever since been living among the most savage tribes. He had a garden, probably twice as large as this room, and the only garden I saw there. The bond of friendship between them is found in the fruits and flowers he teaches them to cultivate. The untutored savages had learned to love him, and had been transformed into kind and peaceable neighbors; and I believe if the Government would pursue the same course with other tribes, much good would result. We could probably civilize them as rapidly, and do them as much good by teaching them to raise flowers as by showing them how to raise something to eat. I believe that by utilizing this universal love of flowers, we have one of the greatest levers in civilization, and if these few off-hand words I have said this evening will induce any of you to join in the good work, I shall be satisfied.

THE WESTERN NEW YORK HORTICULTURAL SOCIETY

Held its thirty-first annual meeting at Rochester, New York, on Wednesday and Thursday, January 27 and 28, 1886. This is one of the oldest and one of the most useful of the societies among the eastern horticulturists.

We make a few selections from the report just issued by the Secretary, P. C. Reynolds, of Rochester:

From President P. Barry's address:—

INCREASING INTEREST IN AGRICULTURE AND HORTICULTURE.

Agricultural and horticultural journals are increasing at an amazing rate, and are also improving in character. A few days ago, I saw a list of one

hundred and fifty agricultural papers, having a combined circulation of nearly three millions, and new ones are still coming. Horticultural journals are also increasing rapidly.

The founding of experiment stations in so many States, and the spirit of liberality which begins to be manifested towards them, is another good sign.

Horticultural societies are increasing, and a more intelligent interest seems to be taken in their work. The exhibitions of last fall, in our large cities, gave evidence of a great advance in the skill and taste of cultivators, and a greatly increased interest on the part of the general public.

Forestry continues to attract attention. An American Forestry Congress was held in Boston last autumn. The results, thus far, cannot be considered of much practical value, but it is well to have the subject agitated and kept before the people. Good must come of it in time.

Progress is being made at the West. From a report published recently, I see that Messrs. Douglass & Son, the well known fruit tree nurserymen of Illinois, have planted for a railroad company, in Kansas, one thousand acres—over three millions of trees, set at four feet apart, and all said to be doing well. They have also planted large tracts for private parties.

There is said to be now over twenty millions of young forest-trees under successful culture in Kansas. This is practical forestry, which we hope to see continued.

The *New York Evening Post*, which is something of a free trader, says: "It is idle to talk about protecting our forests—it is useless to plant trees, or gush over arbor-days, until the duty on foreign lumber is removed. This is the first step, and until this is taken, all the effusive oratory will only serve to make the American people ridiculous in the eyes of the civilized world."

On the other hand, a New England agricultural paper says: "We never could see why the Canadians should have our lumber markets in which to sell their lumber products free of duty, especially while the American coal and iron trades and the manufactured goods of the country are protected by heavy tariff."

There are two sides to this tariff question, and while the newspapers are discussing it, I hope the good work of planting will go on. The tariff will not prevent the trees from growing.

THE FRUIT CROP.

What we want to see in Western New York is first class orchard-culture. The soil made rich with fertilizers; the trees carefully pruned; the fruits thinned, if necessary; gathered in good season, carefully by hand; packed honestly and well, and sent to market by a well considered system—not sold to anybody who comes along, at any price they choose to offer. Our orchard crops may be doubled or quadrupled in value in a few years of thorough work. Without this, orcharding will be, and ought to be, a poor business.

While apples of the common run have been selling at \$1.25 to \$1.50, and at the most \$2 a barrel, fine, well grown Kings, Newtown Pippins, Fameuse, and others, were quoted in New York papers at \$6 to \$10 a barrel; and I know of \$6 being paid for Newton Pippins of fair but not extraordinary quality. The foreign demand for American apples, though large at present, is in its infancy. It is destined to be immense, if we only grow fruit of good quality and put it on the market in good style. So far, our export of apples, generally speaking, has not been well done. The English papers are con-

stantly complaining of the poor quality and bad condition of a large portion of the American apples, and in the very cheapest times say that "prime, large, well-colored apples will find a good market." This is true of our home markets. Now let our orchardists aim at producing prime, large, well colored apples.

LIST OF NEW AND RARE TREES AND SHRUBS.

REPORTED BY GEO. ELLWANGER, OF ROCHESTER.

Acer (*Maple*) *dasycarpum* var. *lutescens*.—A variety of the Silver-leaved, of vigorous growth, with bright-yellow leaves. Its rich, bronze shoots in spring, and tender, yellow-green foliage in summer, will render it a valuable tree for the landscape.

Acer dasycarpum pendulum.—A strong grower, inclined to spread as it ages, the delicate branches drooping. This variety was raised in Berlin from seed.

Acer polymorphum var. *palmatum*.—Leaves five to seven lobed, deep green, changing to crimson in the autumn; habit upright, very compact. This, on our grounds, is the finest tree for autumnal effect; it is the center of attraction in an extended landscape.

Cerasus (*Cherry*) *Japonica pendula*.—Resembles *C. Pumila pendula* somewhat, but much more feathery and graceful; flowers single white; fruit red. Perhaps the finest of the small-headed pendant cherries.

Fraxinus (*Ash*) *excelsior* var. *concavifolia* fol. var.—A charming variety, of compact, pyramidal habit; at first, the leaves are of a rich green, afterwards becoming spotted, and finally turning almost white.

Fraxinus alba argentea marginata.—A medium-sized tree with elegant, variegated foliage; the inner portions of the leaves are a deep green, while the margins are silvery white.

Liriodendron Tulipifera var. *panache*—(Variegated-leaved Tulip Tree.) One of the finest variegated trees; the margins of the broad, glossy leaves are variegated with a very light-green color, giving the tree a striking appearance.

Prunus (*Plum*) *domestica* fol. var.—(New form.) A fine, variegated, small tree; the variegation very distinct, the center of the leaves being deep green, with the margin a pale green. A good companion for *Prunus Pissardi*.

Salix (*Willow*) *rigida pendula*.—When grafted five or six feet high, this makes a fine weeper; the branches are long and slender; the leaves large, glossy, and pale green.

Salix Sieboldii.—An elegant tree, with long, graceful branches, and long, narrow, deep-green leaves.

Ulmus (*Elm*) *campestris* var. *Wheatleyii*.—Compact and upright in habit, with medium to small dark-green foliage. Beautiful for lawn.

Cornus (*Dogwood*) *sanguinea* var. *elegantissima variegata*.—One of the finest variegated shrubs, of rapid growth; leaves broadly margined with white, while some are entirely white.

Cornus Spæthii.—A companion for the preceding; while the variegation in *elegantissima* is white, in this variety it is pale yellow.

Diervilla (*Weigela*) *rosea* var. *Sieboldii alba marginata*.—Of upright habit. When the leaves are young, the variegation is yellow; as they mature, it becomes silvery white; flowers rose colored.

Diervilla hortensis var. *venosa variegata*.—A dwarf grower, forming a compact bush; the variegation is light yellow, changing to white; flowers deep rose.

Syringa (*Lilac*) *Albert the Good*.—An erect, vigorous grower, with large spikes of reddish-purple flowers; the best Lilac of its color; new and fine.

Syringa, Dr. *Lindley*.—Large, compact panicles of purplish-lilac flowers. Very fine.

Syringa, Jacques *Calot*.—One of the finest Lilacs; very large panicles, of delicate rosy-pink flowers; the individual flowers unusually large.

Syringa, Princess Alexandra.—A variety with pure white flowers; panicles medium to large. New and very fine.

Syringa, Prince of Wales.—Panicles medium to large; flowers purplish-lilac, the petals slightly curling near the edge, giving the flower the appearance of being striped. New and fine.

A paper upon ORNITHOLOGY, brought out the following characteristic discussion:

Mr. A. B. Snyder, of Niagara county, said he has a vineyard of several varieties of grapes. The robin and oriole are very destructive of grapes, and, if not protected, his crop would be ruined. Shall he let the birds take them? He scares them, but they return; if he can't scare, he must shoot. If they peck into a cluster, they ruin it for market; and they go rapidly from cluster to cluster, puncturing the ripest spots, and it is surprising how many they will ruin in a short time. He was asked if he was sure that it was the oriole. He replied that he had always understood that it was the oriole, a bright-yellow bird with black wings.

Mr. L. Barber, of East Bloomfield, New York, thought the robin did not peck into grapes until they were riper than necessary for market. The English sparrow is his greatest enemy. Thought other birds protected more than they destroy. Scouted the idea that country people don't hear the birds; might as well say they don't know good fruit.

Mr. Snyder.—In vineyards it is entirely impracticable to gather as soon as ripe, and birds will peck them about as fast as they ripen. Robins will return to their breeding places every year, and, if not destroyed, would soon come in such numbers as would destroy all your grapes.

Mr. John Craine, Lockport.—The oriole will peck the grape before it is ripe enough to eat. Many think bees will destroy grapes, but they will not disturb them until birds have punctured them.

M. F. Varney, North Collins, has seen no birds, but chickens eat his grapes. Sparrows drive away other birds.

Mr. A. J. Caywood, Marlborough.—Some use netting to protect grapes. His early grapes were nearly destroyed by orioles. They will get into the nets. His Champions were destroyed before they were ripe.

Dr. E. L. Sturtevant, Geneva, confessed that he was guilty of importing the first English sparrows. Had dissected them, and found their crops filled with many things, and only a small proportion of insects. They will eat buds in spring, and may eat insects when they can get nothing else, but will destroy wheat without limit. Have destroyed whole plats of wheat, so that it was not worth threshing. Knows no good of him. Birds should be extensively dissected, to see whether they do more good than harm.

Mr. Henry Harrison, of Rochester, was pleased to hear what had been said about sparrows. A few years ago, he said, before this Society, that he would as soon import Asiatic cholera as the English sparrow. He was overwhelmed with opposition then. The song-birds were always welcome to his grounds.

Dr. Hexamer knew that robins destroy fruit; had seen them take strawberries just as they began to color.

THE KIEFFER PEAR.

It originated in that neighborhood several years ago. Opinions differ; like the doctrine of predestination, it is good, or it is bad, as you choose to have it. We most always find good qualities if we are looking for them. Our friend Meehan solved the riddle when he said that he had eaten the Kieffer, grown

by the originator, and found it an excellent pear; he had eaten it when it was decidedly poor. Another prominent fruit man said he had purchased the Kieffer when it was beautiful to look at and very good, and he had bought the second quality which were not good canned nor any way you could fix them. This puts Kieffer growers on their good behavior; their pear has no virtues to spare; it must be in its best estate, or it better not be at all.

THE CATAWBA GRAPE IN NEW YORK.

Lake Keuka, partly in Steuben and partly in Yates county, has come to be the favorite home of the Catawba grape; many other varieties are also grown. The Concord is more hardy and more prolific, and is much the leading grape, but its range is wider, and it can be successfully grown in localities almost as wide as the apple, while the Catawba is a most excellent keeper and highly prized as a wine grape, and requires the most favorable location, and absolutely demands both ends of our seasons in this region, to be favorable. No grape so persistently refuses to be forced out of its location.

No argument, short of actual experience, could convince that the Catawba would grow and bear satisfactorily on Seneca, Keuka, and Canandaigua lakes, and not on the Hudson, so similar in its relations of heat, air, and moisture. So far as is known, the Catawba will not flourish near a salt atmosphere. As produced on Seneca Lake, the Catawba, in all good qualities, was first twenty years ago, is now, and will be twenty years hence. It improves on acquaintance. So pure and spirited is its flavor that he who eats his fill of good Catawbas, enjoys the last grape eaten equally with the first; and only regrets that he has not capacity for more. The recollections of its richness and goodness is a pleasant memory.

INCREASING THE ATTRACTIONS OF HOME.

J. J. THOMAS, of Union Springs, concludes an article on this subject, as follows:

The health and enjoyments of the inmates of a home, may be substantially promoted by securing a perfect *circle of fruits*, that is, by planting such a succession as shall give a good supply the year through. Beginning to ripen early in June, the earliest strawberries, followed by the latest sorts, will give a few quarts daily for the table through the month; cherries will closely follow; currants and raspberries immediately succeed them; the earliest pears and apples are next in succession, and such early peaches as the Alexander and Amsden, if the winter does not destroy the crop. Peaches, plums, apples, and pears, with blackberries, extend through the month of August. A profusion of many sorts may enrich our tables through the whole of autumn. Winter fruits consist of all the early, medium, and late winter apples; the Lawrence, Winter Nelis, Anjou, Malines, and Dana's Hovey pears; and several delicious sorts of our native grapes, when properly kept in a suitable apartment. I have kept them nearly into spring; have had the Lawrence pear in March; and have had fresh specimens of the Baldwin apple in the middle of June, as the Duchess and Crescent strawberries were beginning to show their ruddy fruits.

This is an almost endless subject, but I will not encroach further on your time than to sum up a few of the matters which I have attempted to present.

1. Build your house on a dry, healthy foundation.
2. Have a dry walk from the house to the barn; do not tread in mud.

3. Remember that buildings cost much, and neatness and planting but little.
4. Have a pleasant, home like exterior—
5. And plenty of household conveniences within.
6. Never board hired men, but provide cottages for them.
7. Provide a home museum for the young people.
8. Surround the dwelling with a smooth lawn, graceful shrubbery, and blooming flowers.
9. Give the shade of trees where space admits it.
10. Give beauty and finish, instead of disorder and waste.
11. Secure pure air, with nothing to impart impure odors.
12. Provide a complete circle of fruits.
13. Introduce horse labor, and clean, thorough culture.
14. Assist the young members of the family in the study of the natural sciences, in collecting objects, and in sketching and drawing.
15. Cultivate, as the most valuable of all attractions, those benign virtues which will always present pleasant and kind faces in the occupants of the home.

DISCUSSION UPON NEW FRUITS.

GRAPES.—Mr. A. J. Caywood, Marlborough, being urged to speak, said he had some of the best new grapes in the world. Mr. Green had visited Mr. Caywood, and thought he had some very excellent grapes, some of which he had tested ten to fifteen years. Thought ULSTER PROLIFIC especially good. Mr. Caywood said Mr. Johnson, of Indiana, had fruited it, and spoke very highly of it at American Pomological meeting, at Grand Rapids. We want more good grapes, and Ulster Prolific is a good grape. Ripens with Concord, but sets its fruit before any other; a cross of a wild grape upon Catawba, free from mildew or rot. Mr. I. H. Babcock asked if he would recommend it for market. Mr. Caywood replied that he had none yet for market, but had sent it by mail to a great distance and carried remarkably well.

Dr. Beadle said JESSICA is being tested in Ontario. Mr. Arnold, of Benton Center, had grown two bunches of Jessica the past season, and thought it very good. Mr. J. O. Rupert, Penn Yan, said Jessica mildewed with him, and did not make a large growth.

THE EMPIRE STATE.—Mr. Eugene Glenn, Rochester, went to Branchport when this new white grape was in bearing, and found it quite as ripe as Concord. In his opinion, it is *the* white grape for that section.

RASPBERRIES.—Mr. Green said Marlboro gives good satisfaction; thought it deserved more attention. Commences ripening early, and continues long. President Barry concurred. Mr. Caywood has thrown out everything else, and other growers along the Hudson are doing the same. Firmer than Cuthbert, no variety bears carrying better. Mr. Willard—Marlboro is proving very satisfactory.

Mr. Vandusen has evaporated Shaeffer, and sold for thirty cents a pound; requires four quarts to a pound; more productive than black-caps. Mr. Varney.—It sells for three or four cents a quart more than black-caps, but some think it is not so heavy a bearer. Mr. Hooker said the fruit is fine for family use, but its color is against it in market. Mr. Vandusen regarded it as one of the best for canning; more sugar should be used than for blacks. Mr. Shelby Reed said Shaeffer originated on clay loam.

Mr. Hooker said he was not satisfied with Hansel, neither early nor good. Messrs. Willard and Beadle concurred with Hooker. Mr. Caywood said on the light, sandy soil of New Jersey, Hansel is early, but on heavy soil it is not.

STRAWBERRIES.—Doctor Hexamer spoke in warm praise of Jewell, which he considered the most promising of new varieties. Large, good shape, color, and size, and of good, but not highest quality. Has done well in several localities. A pistillate. President Barry believed it to be a promising berry. Mr. Woodward said it is the most productive of all on poor land, and *very* productive on rich. The entire run of the crop averages very large. Not of the highest quality, but much better than many called good.

BEST MARKET PEARS FOR WESTERN NEW YORK.

“Are Le Conte, or any of the China and Japanese varieties likely to prove valuable here, and are they as liable to ‘fire-blight’ as other sorts?”

Mr. Ellwanger named Bartlett. President Barry named Boussock and Duchess. Mr. Zimmerman named Howell, Clairgeau, and Beurre Superfin. Mr. Bronson thought there is as much money in Boussock as any; also named Lawrence. Ellwanger named d’Anjou, Nelis, and Josephine de Malines.

Mr. Caywood said that he was surprised that pomologists, who are rejecting pears because of inferior flavor, should recommend Boussock.

Mr. Ellwanger was asked how they keep their pears so that they look so beautiful on exhibition. He replied that they keep them in their packing-house, which is over a cellar, and the sides and also ceiling are double, and filled in between with saw-dust. They are kept in boxes, and kept as nearly of uniform temperature as possible by ventilation.

Mr. Bronson said Kieffer sold in market very well.

Mr. Willard said Le Conte will endure our winters, but is worth nothing after you get it. Kieffer is a pretty good pear and sells well; gave an instance where it sold higher than Clairgeau. Woodward.—Kieffer produces a handsome pear, and good for those who like them; his folks do not, and leave them lying on the ground all winter, and even the mice will not eat them. Mr. Hexamer said it was utterly impossible for Kieffer to be in an eatable condition.

MARKET GRAPES.—“Which is the profitable market grape for Western New York, and which the best three for market, and the best three for family use?”

Mr. D. M. Dunning, Auburn, named Catawba. Worden is not shipping well.

F. A. Hixson, Vine Valley, said his most profitable are Catawba, Delaware, and Concord. For family use would substitute Brighton for Concord. Jeremiah Gardner, city, named Barry as one of the best market grapes, and will outsell Concord; inclined to overbear. Mr. Caywood spoke favorably of Barry. Mr. Snow said that on Keuka and Seneca Lakes they are not agreed, some preferring Catawba, some Delaware, and others Concord. Mr. Wells, Onondaga, said Catawba will not ripen with them; Delaware, Concord, and Niagara are preferred there. Dr. Beadle said Worden is a profitable grape in Ontario. Mr. Hoag named Concord, Delaware, and Niagara. Thought when Niagara becomes abundant there will not be much sale for Concord. Niagara is a good shipping grape; sent some to Winnipeg, and they arrived in good order. Mr. Barber.—Catawba is the most profitable in Naples. Mr. Vandusen has a vineyard of Niagaras, set two years ago; last season they bore from thirteen to fifteen pounds to the vine. Mr. Wells sent several varieties to Dakota, and Niagara got through in best condition.

PAPER BAGS FOR GRAPES.—“*What is the result of their use?*”

Mr. Wells used 2,000 paper bags in August, and it made no difference in time of ripening. The bags keep them in good condition as long as you wish.

to leave them hanging on the vines; keep them from soiling when near the ground. Mr. Hoag put on bags two weeks after out of blossom, kept them in fine condition, and can be left on the vines after frosts. You can leave them on after picking, and will protect from freezing. Whoever uses bags should clip the lower corner to provide for escape of water. They are a protection from birds. Cost seventy-five cents a thousand. Slip a bag on a bunch, turn over corner, stick a pin through, and will soon rust so it will not come out. A man can put on from 1,500 to 2,000 a day.

RETARDING FRUIT HOUSE.—“*What is the best method of constructing houses to retard the ripening of fruit?*”

Mr. Snow said, Catawba grapes are kept in cellars or in rooms partly above and partly below ground, made frost-proof, with enough circulation of air to carry off moisture, and change atmosphere. Mr. Van Dusen said, it is a good plan to leave grapes out in the open air, covering nights, as long as possible. Mr. Sanderson is, first careful in picking, so as to break none from the stem; keeps outside as long as possible; opens cellar windows nights, and closes in day time, as long as safe; then keeps in a dark cellar, covered with papers. Mr. Green can keep them in dry sawdust through the winter. Dr. Sturtevant has Concord in cellar in picking-boxes, in good condition, now. Mr. Wells puts them in baskets, covers with leaves, and hangs up in cellar.

TESTING NEW FRUITS.—“*When the originator of a new fruit sends it out to be tested, is the tester's first duty to the originator or the public? In other words, if the variety proves unworthy, should the tester make it public, even to the detriment of the originator?*”

Mr. Woodward believed originators of new fruits had as much right to them as inventors of machines. Many seem to think that they have a right to what they can get. Mr. Augur put the Jewell into hands to test it, and one man has ten thousand plants that he put out for his own use. Originators have never been paid for their work; have never received one dollar, where they ought to have received one hundred dollars. We greatly need, in this country, stations to test new fruits. The New York Agricultural Experiment Station promises not to send out any put in their hands to test. New fruits should be placed in these stations for testing. The first duty of the tester is to the public, and unless he does report against those that prove unfavorable, it will be of little use.

ROSES —“*Which are the best dozen hardy hybrid perpetuals for the average cultivator, and what is the best method of protecting in winter when protection is necessary.*”

Mr. George Ellwanger, Rochester, presented the following list:—

Best dozen hardy hybrid perpetual roses for the average cultivator: Alfred Colomb, Anne de Diesbach, Baron de Bonstetten, Baroness Rothschild, Eugenie Verdier, Fisher Holmes, John Hopper, Marshall P. Wilder, Paul Neyron, Madame Gabriel Luizet, General Jacqueminot, Francois Michelon, Caroline de Sansal.

The varieties on this list are hardy in this climate, but all roses are better for a light covering. I hill up the earth about six inches, or cover them about one foot with leaves or straw. Evergreen branches are also good for protection.

TREASURER'S REPORT.

RECEIPTS.

1884.			
Nov.	24.	Balance on hand, per last report.....	\$1,083 75
1885.			
May	14.	State appropriation	1,000 00
Dec.	1.	Memberships received to date	150 00
Total			<u>\$2,233 75</u>

EXPENDITURES.

1884.			
Nov.	29.	Express and telegraph, and circulars.....	\$2 75
Dec.	5.	Paid janitor at Board of Trade room	2 25
	5.	“ premiums on exhibits at Annual Meeting.....	55 00
	21.	“ circulars New Orleans Exhibition, etc.....	5 25
1885.			
Feb.	26.	Lecturers at Farmers' Institutes :	
		H. G. Tryon	13 30
		G. H. Miller.....	17 35
		Wm. Miller	11 50
		W. W. Farnsworth	15 75
		L. B. Pierce	29 95
		G. W. Campbell	2 00
		S. H. Hurst.....	10 05
March	23.	Paid A. C. Armstrong, stenographer.....	60 00
May	23.	“ sundry express charges—Secretary	2 95
June	5.	“ Allison & Smith's bill, engraving, etc	14 60
	10.	“ express charges to Columbus	25
July	7.	“ postage stamps for circulars—Secretary	3 00
	15.	“ W. H. Ragan, Miss. Valley Hort. Reports.....	25 50
Aug.	4.	“ express on Indiana Reports	35
	21.	“ stamps for circulars—Secretary.....	3 00
Sept.	2.	“ posters, and putting up—State Fair Meeting..	3 50
	3.	“ for Board of Trade Room	2 50
	5.	“ postage stamps and wrappers—Annual Report	12 00
	5.	“ express charges on Reports from Columbus..	1 70
	10.	“ express charges on fruits to Grand Rapids	5 25
	12.	“ Myers Bros. bill, printing Report	45 00
	12.	“ F. T. Evans, printing circulars and envelopes	4 80
Oct.	1.	“ postage stamps for reports	3 50
	13.	“ express charges on Wisconsin Reports	75
	13.	“ express charges on Reports to Willoughby.....	35
Nov.	18.	“ stamps and envelopes for Annual Meeting	16 10
	21.	“ printer's bill for circulars, Annual Meeting....	9 25

Amounts carried over..... \$379 50 \$2,233 75

1885.	Amount brought over.....	\$379 50	\$2,233 75
Dec. 4.	Ad Interim expenses:		
	N. Ohmer, President.....	63 50	
	H. Y. Beebe, Vice President	39 98	
	Leo Weltz, Treasurer	63 46	
	Geo. W. Campbell, Secretary	39 10	
	W. W. Farnsworth	58 90	
	Wm. Miller	24 95	
	E. H. Cushman	29 20	
	L. B. Pierce	17 65	
	F. R. Palmer	30 75	
	G. H. Miller.....	8 30	
	Daniel Duer	25 50	
	W. J. Green	41 60	
	Matthew Crawford.....	10 00	
	N. H. Albaugh	11 10	
	A. G. Babcox, delegate	20 52	
5.]	Premiums paid at Annual Meeting	60 00	
31.]	Secretary's salary one year, to date	300 00	
		<hr/>	
		\$1,224 00	
	Amount paid to J. J. Harrison, Treasurer.....	1,009 75	
		<hr/>	
			\$2,233 75

OFFICERS AND MEMBERS

OF THE

OHIO STATE HORTICULTURAL SOCIETY,

FOR THE YEAR 1886.

[All names marked with a star (*) have paid membership fees for 1886.]

OFFICERS.

*NICHOLAS OHMER, <i>President</i>	Dayton.
*H. Y. BEEBE, <i>Vice President</i>	Ravenna.
*GEORGE W. CAMPBELL, <i>Secretary</i>	Delaware.
*J. J. HARRISON, <i>Treasurer</i>	Painesville.

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*R. H. WARDER	North Bend.
*A. F. NEWELL	Warren.
*S. H. HURST	Chillicothe.
*MATTHEW CRAWFORD	Cuyahoga Falls.
*W. W. FARNSWORTH	Waterville.
*W. J. GREEN	Columbus.
*E. H. CUSHMAN	Euclid.
*F. R. PALMER	Mansfield.
*LEO WELTZ	Wilmington.
*N. H. ALBAUGH	Tadmor.

LIST OF MEMBERS.

Name.	Post-office address.	County.
*Adams, Rev. G. A.	Perrysburg	Wood.
*Albaugh, B. F.	Covington	Miami.
*Albaugh, N. H.	Tadmor	Montgomery.
*Aldrich, O. W.	Franklin	Franklin.
Anderson, J. C.	Carlisle	Warren.
*Babcox, A. G.	Plymouth	Richland.
*Baker, John	Eldorado	Preble.
*Bear, S. D.	Dayton	Montgomery.
*Beaver, Jno. F.	Dayton	Montgomery.
*Beebe, H. Y.	Ravenna	Portage.
Bement, Samuel	Toledo	Lucas.
*Bilderback, J.	Millersburgh	Holmes.
*Bitzer, Michael	New Berlin	Stark.
Berlin, B. T.	Louisville	Stark.
*Buechly, E.	Greenville	Darke.

LIST OF MEMBERS.—Continued.

Name.	Post-office address.	County.
*Busser, W. T.....	Urbana.....	Champaign.
Cahoon, J. M.....	North Dover.....	Cuyahoga.
*Cahoon, L. J.....	North Dover.....	Cuyahoga.
*Campbell, G. W.....	Delaware.....	Delaware.
Chamberlain, W. I.....	Columbus.....	Franklin.
*Carpenter, Chas.....	Kelley's Island.....	Erie.
*Claypole, E. W.....	Akron.....	Summit.
Cox, Nelson.....	Bradrick.....	Lawrence.
*Crawford, M.....	Cuyahoga Falls.....	Summit.
*Crew, H. W.....	West Milton.....	Miami.
*Cushman, E. H.....	Euclid.....	Cuyahoga.
*Cushman, H.....	Euclid.....	Cuyahoga.
*Davis, C. A.....	Eldorado.....	Preble.
*Duer, Daniel.....	Millersburg.....	Holmes.
*Duer, Z. T.....	Millersburg.....	Holmes.
*Dix, William.....	Millersburg.....	Holmes.
*Ernest, Henry.....	Warren.....	Trumbull.
Ewing, John.....	Dayton.....	Montgomery.
Farr, J. N.....	Mantua Station.....	Portage.
Fetters, J. A.....	Lancaster.....	Fairfield.
Fogg, Waldo.....	Salem Center.....	Meigs.
*Farnsworth, W. W.....	Waterville.....	Lucas.
*Gardner, A. T.....	St. Clair.....	Columbiana.
Gardiner, C. C.....	Freedom.....	Portage.
Graham, W. A.....	Zanesville.....	Muskingum.
*Grondyke, S.....	Eugene, Indiana.....	Vermillion.
*Grover, Leveret.....	Chardon.....	Geauga.
*Green, W. J.....	Columbus.....	Franklin.
*Haerlin, Herman.....	Cummins ville.....	Hamilton.
Hale, C. O.....	Ira.....	Summit.
Hale, Albert.....	Mogadore.....	Summit.
Hale, A. M.....	Mogadore.....	Summit.
Harter, M.....	Akron.....	Summit.
*Harrison, J. J.....	Painesville.....	Lake.
High, George M.....	Middle Bass.....	Ottawa.
Hoadley, George.....	Columbus.....	Franklin.
*Horr, Q. D.....	Delaware.....	Delaware.
Housekeeper, G. C.....	Bowling Green.....	Wood.
Hurst, J. R.....	Chillicothe.....	Ross.
Hurst, S. H.....	Chillicothe.....	Ross.
*Innis, G. S.....	Columbus.....	Franklin.
*Innis, M. P.....	Columbus.....	Franklin.
*Innis, Wm. H.....	Columbus.....	Franklin.
*Jackson, S. S.....	Cincinnati.....	Hamilton.
*Jameson, M. A.....	Lebanon.....	Warren.
*Janney, J. J.....	Columbus.....	Franklin.
*Jenkins, J.....	Winona.....	Columbiana.
*Julian, N.....	Circleville.....	Pickaway.
*Julian, N. W.....	Circleville.....	Pickaway.
Kellogg, H.....	Toledo.....	Lucas.
*Ketchum, S. S.....	Toledo.....	Lucas.
King, E. T.....	Carey.....	Wyandot.
King, William.....	Newton Falls.....	Trumbull.
*Lauppe, Charles.....	Urbana.....	Champaign.
Lawrence, W. H.....	Cleveland.....	Cuyahoga.
Lazenby, W. R.....	O. S. U., Columbus.....	Franklin.
*Linxweiler, Jacob.....	Dayton.....	Montgomery.
Lohman, Wm. H.....	Greenville.....	Darke.
*Longstreth, Wm.....	Dayton.....	Montgomery.

LIST OF MEMBERS.—Continued.

Name.	Post-office address.	County.
Miller, Daniel J.....	Saltillo	Holmes.
*Miller, F. C.....	New Philadelphia.....	Tuscarawas.
Miller, G. H.....	Norwich	Muskingum.
*Milton, Mansfield	Youngstown	Mahoning.
*Mitchell, James B.....	Grove City.....	Franklin.
*Moore, S. R.....	West Zanesville.....	Muskingum.
Muchmore, J. D	Fremont	Sandusky.
*McMaster, Horace.....	Leonardsburg	Delaware.
Newton, G. F.....	Millersburg	Holmes.
Neisz, J. K	Canton	Stark.
*Newell, A. F.....	Warren.....	Trumbull.
*Nichol, A. M.....	Greenville	Darke.
*Nickerson, Joshua.....	New Burlington.....	Clinton.
*Ohmer, N.....	Dayton	Montgomery.
Oving, Rev. E. H.....	Wadsworth	Medina.
Ohmer, J. P.....	Hamden Junction.....	Vinton.
*Palmer, F. R.....	Mansfield	Richland.
*Patterson, Chas	Kirksville, Mo.....	Adair.
*Pentland, F.....	Lockland	Hamilton.
*Pickham, W. C	Loveland	Clermont.
Pierce, L. B.....	Tallmadge	Summit.
Poste, John.....	Columbus	Franklin.
*Pickett, G. S.....	Clyde	Sandusky.
*Pfirmer, Jacob	Milford	Clermont.
Ray, J. B.....	Omega	Pike.
Read, M. C.....	Hudson	Summit.
*Rhoads, Emmet V.....	St. Paris	Champaign.
Robbins, H. B.....	Hamden Junction.....	Vinton.
*Saxton, J. A.....	Canton	Stark.
*Shinkle, G. W.....	Hamersville	Brown.
Snider, J. S.....	Lancaster	Fairfield.
*Stanton, W	Barnesville	Belmont.
*Steele, R. W.....	Dayton	Montgomery.
*Storrs, W. G.....	Painesville.....	Lake.
Streator, George H	Garrettsville.....	Portage.
*Streeper, J. P.....	Chillicothe	Ross.
*Townshend, Dr. N. S.....	Columbus	Franklin.
Townsend, W. J.....	Zanesville	Muskingum.
*Trowbridge, G. W.....	Glendale	Hamilton.
Tryon, H. G	Willoughby.....	Lake.
Tryon, J. H.....	Willoughby.....	Lake.
Uhl, E. A.....	Millersburg	Holmes.
*West, W. H.....	Chillicothe.....	Ross.
*Wilson, S. M.....	Forest	Hardin.
Willson, Andrew	Ravenna.....	Portage.
Witt, Michael.....	Columbus	Franklin.
Weltz, Leo.....	Wilmington ..	Clinton.
Westwater, J. M	Columbus	Franklin.
*Wilson, Horace	Columbus	Franklin.
*Warder, R. H.....	North Bend.....	Hamilton.
*Young, Henry	Ada	Hardin.

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APPENDIX.

FOURTH ANNUAL REPORT

OF THE

OHIO AGRICULTURAL

EXPERIMENT STATION,

FOR

1885.

PRINTED BY ORDER OF THE STATE LEGISLATURE.

OHIO STATE UNIVERSITY,
COLUMBUS, O., *March 1, 1886.*

To Governor J. B. Foraker:

SIR: I have the honor to submit herewith the annual report of the Ohio Agricultural Experiment Station, for the year 1885.

I trust it will meet the approval of your Excellency and the General Assembly, and prove satisfactory to those engaged in Agriculture and Horticulture, for whose benefit the Station was established.

Very respectfully,

WILLIAM R. LAZENBY, *Director.*

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BOARD OF CONTROL AND OFFICERS
OF THE
OHIO AGRICULTURAL EXPERIMENT STATION, 1885.

STATE BOARD OF CONTROL:

HIS EXC. GOV. J. B. FORAKER.....	<i>Ex-Officio.</i>
WILLIAM R. LAZENBY	<i>Director.</i>
EMMETT MIX, Avenue	<i>President.</i>
W. N. COWDEN, Quaker City	<i>Secretary.</i>
J. C. STEVENS, Kenton	<i>Treasurer.</i>

OFFICERS:

Director :

WILLIAM R. LAZENBY.

Chemist :

H. A. WEBER.

Superintendent of Field Experiments :

W. B. ALWOOD.

Botanist :

W. S. DEVOL.

Horticulturist :

W. J. GREEN.

GENERAL ANNOUNCEMENT.

The Ohio Agricultural Experiment Station was established in accordance with an act of the General Assembly, approved April 17, 1882, "for the benefit of the interests of Practical and Scientific Agriculture, and for the development of the vast agricultural resources of the State."

The experiments and investigations are carried on both in the field and laboratory, and deal with the following great agricultural interests, viz.: (1.) Grain Raising. (2.) Stock Farming and Dairy Husbandry. (3.) Fruit and Vegetable Culture. (4.) Forestry.

The Station is prepared to test varieties; to analyze and test fertilizers and manures, soils, waters, milks, cattle-foods, etc.; to examine seeds that are suspected of being unsound or adulterated; to identify and name weeds and other plants; to investigate and describe, when known, the habits of injurious and beneficial insects, and other work of a similar character that properly comes within its province.

It is the desire of the Board of Control to make the Station as widely useful as its limited appropriation will permit. To this end we earnestly invite the co-operation of the people and press of the State.

All communications on agricultural and horticultural topics will be fairly considered, and, as far as possible, promptly answered. Detailed reports of experiments, carefully and conscientiously made, will aid the Station in its work. Any citizen of Ohio, who is concerned in the promotion of agriculture, has the right to apply to the Station for any information it can render, and the Station will cheerfully respond to all applications, as far as lies in its power.

Samples of different varieties of corn, wheat, oats, barley, and other grains; the seeds of fruit and forest trees; vegetables and flowers, that are true to name; specimens of grasses, weeds, and other plants that may be of interest; sections of different varieties of wood; specimens of injurious and beneficial insects; those, and other articles and materials illustrative of any department of agriculture, will be gladly received.

Address all communications to

WILLIAM R. LAZENBY, Columbus, Ohio.

EXPERIMENT GROUNDS AND OFFICES

AT THE

OHIO STATE UNIVERSITY, COLUMBUS, O.

REPORT OF THE BOARD OF CONTROL.

To the General Assembly of the State of Ohio :

GENTLEMEN: We submit to your honorable body the Fourth Annual Report of the Director and other officers of the Ohio Agricultural Experiment Station for the year ending March 1, 1886.

The work carried on the past year has been a continuation of the investigations begun when the Station was organized, together with such additional experiments as means and opportunity have rendered possible. We are happy to state that the past year has been one of substantial progress.

Letters from all portions of the country cordially commend the work that is being done, and we feel justified in renewing the assertion of last year, that for the money expended no public institution is doing more for the welfare of the citizens of our State.

The contents of this and former reports bespeak the degree of success that has attended our efforts.

It is confidently expected that the Experiment Station will have a still wider scope in the future than it has had in the past. Thus far its work has been in a great measure directed to a comparatively few staple crops.

Henceforth it will seek to embrace the great agricultural interests of the State more in detail, giving prominence, as heretofore to staple products, while devoting as much attention as possible to stock-feeding, breeding and dairy husbandry, not neglecting the meadow, orchard and forest; in short, to study and report upon all subjects about which the farmer most needs to know. It is designed to increase the working force of the Station by the appointment of a Veterinarian, an Entomologist, and a Superintendent of Experiments in Forestry.

Thus officered and equipped, the Station looks hopefully to new achievements, and wider fields of usefulness.

EMMETT MIX,
President of Board of Control,

W. N. COWDEN,
Secretary of Board of Control.

FOURTH ANNUAL REPORT.

INTRODUCTION.

The object of the Ohio Agricultural Experiment Station, together with the nature and scope of its work have been sufficiently explained in previous reports.

This work has gone on without interruption the past year, and is herewith presented in detail.

The primary object of the Station is to suggest improvement in farm and garden management. It seeks to apply scientific principles to practical agriculture and horticulture. Its aim is to show how the products of the farm may be increased, and the cost of production diminished.

Experiments that lead to reliable conclusions require skill, time and money. The Station has faithfully devoted whatever of these requisites it had at command to the object for which it was established.

SUMMARY OF YEAR'S WORK.

As heretofore, field experiments with grain, fruit and vegetables have claimed a large share of the Station's attention.

In addition to this some feeding experiments have been undertaken, and numerous special investigations have been made.

In connection with this work the climatic conditions have been regularly noted; numerous chemical analyses have been made; observations have been instituted to study the effect of special commercial fertilizers; the best methods of meeting certain insect enemies and checking plant diseases; experiments in cross fertilization have been repeated and the study of weedy plants continued.

CORRESPONDENCE.

This has been extensive and varied. Over twenty five hundred letters have been answered by the Station officers during the past year. They were mainly of inquiry and came from all parts of the United States and Canada. Many of these letters asked for information concerning varieties of grain, grass, fruit, vegetables, noxious weeds and injurious insects. Others inquired about the management of stock, the preservation and use of farm yard manure, the application of commercial fertilizers, methods of cultivation, and many other subjects pertaining to agricultural practice. All communications of this character have been fairly considered, and with few exceptions promptly answered.

TESTING THE PURITY AND VITALITY OF SEEDS.

This continues to be a very useful feature of the work of the Station, and the oft-repeated assurances of losses averted by means of tests made, are sufficient proof of its importance.

Good crops cannot be raised from poor seed, no matter how favorable all other conditions of success may be.

The saving to the State by the improved methods of selecting and preserving seed corn alone, is worth many times the whole cost of the Station since its establishment. Special attention is called to this portion of the report.

NAMING PLANTS AND INSECTS.

A larger number of specimens of weeds, grasses and other plants, grain, fruit and insects have been sent to the Station for name and history during the past year than ever before. These specimens, almost without exception, have been identified and fully described. Special pains is taken to give all the information possible regarding the history, habits and remedies for weeds and insect pests.

DETECTING BOGUS BUTTER.

Few subjects are attracting more attention at the present time than the adulteration and counterfeiting of butter. Some recent experiments made by the Department of Agriculture at Washington, appear to give conclusive evidence that by the aid of the microscope genuine butter could be readily distinguished from butter substitutes. An elaborate investigation of this subject by the chemist of the Station has led to a different conclusion.

The report on this subject is of great interest, and will repay careful study.

FORESTRY.

A State Forestry Commission having been appointed by the last Legislature, with a special appropriation for carrying on its work, the Station has done but little the past year in extending its experiments in forest-tree culture. Something has been done, however, and earnest attention is called to this portion of the Report. There are few subjects connected with the welfare of the State that demand more serious attention.

The Station is endeavoring to show how our best timber trees can be cheaply and successfully grown from seed; which are the best varieties for different soils and exposures; the best methods of transplanting and trimming; the best time to cut, and the most effective way of preserving timber.

To do this wisely is to render the State a service of signal value.

STATION PUBLICATIONS.

During the past year brief bulletins, circulars and notes have, from time to time, been published. These have been extensively copied by the agricultural press, and have received many words of commendation. As no provision is made by the act establishing the Station for any publication except for the annual report, with the means at command little can be done in the way of issuing frequent bulletins. A slight increase in the appropriation would provide for the prompt dissemination of the results of the Station's work.

Arrangements are now being perfected by means of which the leading agricultural journals and other newspapers of the State will serve as efficient means of communication between the Station and those for whose benefit it was created.

ACKNOWLEDGMENTS.

During the past year the Station has received many valuable donations, for which it returns heartfelt thanks. These gifts not only add to the efficiency of its work, but show that its labors are cordially approved.

The kind words with which the last report was received have greatly encouraged the Board of Control and officers. Working without any adequate compensation, the assurance that their efforts in behalf of the agricultural interests of the State are appreciated by those best fitted to judge, is a welcome reward. Friendly counsel and cordial co operation cannot fail to inspire new zeal in all connected with the direct management of the Station.

It is the earnest purpose of those into whose hands the direction has been given, to keep the Station up to the high ideal with which it started.

The Station cannot be regarded as the exclusive property of any special class. It has a wide scope, and aims to benefit all who will mingle thought with work. Through its teaching, practice may obtain the benefit which science can confer, and science may be guided into broader fields of usefulness under the suggestive needs that only practice can point out.

WILLIAM R. LAZENBY,
Director.

REPORT OF SUPERINTENDENT OF FIELD EXPERIMENTS.

EXPERIMENTS IN WHEAT CULTURE.

The experiment plots of wheat were almost a total failure the past year from the unprecedented severity of the winter.

The general appearance of the work was never better than during the fall of 1884, but, unfortunately, the field lay bare of snow, and in an exposed situation, so that wind and frost had a fair chance to do their worst. The plants were not heaved or broken, and this led us to hope that many would revive with the spring rains, but in this we were disappointed, except in a few instances as hereafter noted.

As early as practicable one-half of each plot was harrowed and rolled, but without any effect. From a large majority of the plants new roots started, but the vitality was so much exhausted, and the spring weather being unfavorable, there was no growth above ground, and they were soon entirely dead. Several examinations of the ground in early spring, showed that the frost had penetrated two and one-half to three feet deep.

The wheat fields of the University Farm Department were only a short distance from the experiment field, situated on the Olentangy bottom, except one field which extended a short distance on the upland. The crop on these fields was quite good, not up to the average produced here, but much better than the average of the State. In the spring the plants on these fields appeared to be frozen nearly or quite as bad as on the experiment plots, but they very soon showed signs of vitality, and produced yields as hereafter given. The difference in elevation between the upland and lowland is 30 to 50 feet. The soil of the upland is a brownish gray clay loam. The bottom land is a black loam and alluvial deposit, which scarcely ever suffers from lack of moisture. The soil of the experiment field is quite apt to suffer from this cause.

The bottom fields had some slight protection from a fringe of forest trees along the river. The yields from the fields of the farm were as follows:

Velvet Chaff, field No. 1.....	8 acres; 15.7 bushels per acre.
“ “ 2.....	14 “ 19.1 “ “
“ “ 3.....	5 “ 21.4 “ “
Martin's Amber.....	1½ “ 24.0 “ “
Valley.....	4½ “ 15.1 “ “
Finley.....	4½ “ 32.2 “ “

It did not occur to us in the early spring to examine the bottom fields to see how deep they were frozen. We do not offer any one special reason for the different results of these fields situated so nearly together, but have set forth the points of difference in the conditions of each. In some localities upland wheat survived and lowland wheat was destroyed, and *vice versa*. It is probable that the amount of moisture, and the exposure to and severity of the winds are important factors in the question.

Of the Station's variety experiments in large plots, but one produced any appreciable crop. This was Russian May; a variety not noticeable for any

especially good qualities. It somewhat resembles Finley. It had about 15 per cent. of a stand and yielded 11 pounds of wheat from $\frac{1}{32}$ of an acre. The straw was too weedy to be weighed. This plot was in the most exposed part of the field. Two other plots near the fence, and at times protected by snow, produced a few bundles of wheat. Of this small yield no notice was taken.

Velvet Chaff in the same series of plots, was entirely destroyed, yet produced a partial crop in other parts of the field, as will appear further on.

The varieties sown in small plots which made any stand at all are here noted:

- Alabama, just a few stalks.
- Big Frame, about 40 per cent.
- Blue Stem, about 30 per cent.
- Canada Club, just a few stalks.
- Golden Drop, about 5 per cent.
- Hicks, few stalks.
- Hungarian White Chaff, few stalks.
- Menonite, about 40 per cent.
- Red Chaff, about 5 per cent.
- Red May, about 8 per cent.
- Rice, few stalks.
- Rickenbrod, few stalks.
- Russian May, about 50 per cent.
- Siberian, about 80 per cent.
- Small Frame, 40 per cent.
- Yellow Missouri, about 30 per cent.
- Zimmerman, about 90 per cent.

The ordinary plot of Zimmerman was entirely destroyed, while the plot resulting from the best selections of two previous years produced nearly full crop.

All other selections aside from this were entirely lost, so also were the plants from crosses made the previous season.

Aside from Zimmerman just mentioned, the most noticeable stand was Siberian. This is a late not especially promising wheat, but made a remarkable record when almost everything was destroyed around it. We were able to re-sow nearly all our former list of varieties this fall and added to it a large number of new ones. The special work with varieties will be further noticed after a brief discussion of the field plots.

None of the plots of fertilizer-work were cut separately, the best stand being only about two per cent. of a crop. It was particularly noticeable that where fresh horse manure was used not a stalk appeared. Where composted manures were used there was in each instance a slight stand. The animal manures were all applied as a top dressing, at the rate of 16 tons per acre. This practically amounted to a light mulch. Of the special manures, occasionally one plot appeared to show some slight advantage over another, but this was not sufficiently marked to admit of any conclusions to be drawn. Incidental differences of soil, drainage, etc., must always be considered as elements of variability in field experiments.

In the case of the plot treated with horse manure, above mentioned, the destruction was so complete as to leave little doubt about the manure helping to produce the result. This plot was one of the most rank in fall growth, and those who read the Station report for 1884 will remember that the plot treated with fresh horse manure produced the maximum yield of wheat. No doubt the vigorous fall growth made the plants of this plot more tender than those of others.

THICK AND THIN SEEDING.

The work in thick and thin seeding made sufficient stand to warrant the harvesting of the plots separately. The per cent. of stand seems to have been greater or less according as there was a greater or less amount of seed used. The crop was very slight on the thinnest sown plots, but all were cut and threshed that the record might be as complete as possible. The yields were as follows from $\frac{1}{16}$ -acre plots:

	Seed per acre.	Weight	Yield per acre.	
		of grain from plot.		
		<i>Lbs.</i>	<i>Bus.</i>	<i>Lbs.</i>
1	Two pecks.....	4	1	4
2	Three pecks	6 $\frac{3}{4}$	1	48
3	Four pecks	12 $\frac{1}{2}$	3	20
4	Five pecks.....	12	3	12
5	Six pecks.....	17 $\frac{1}{4}$	4	44
6	Seven pecks	19	5	4
7	Eight pecks.....	23 $\frac{1}{4}$	6	12
8	Nine pecks	28 $\frac{1}{4}$	7	32

One comparison will show that the rate of increase in yield was greater than the rate of increase in seed.

The increase in seed used on plots one to eight was 450 per cent., and the increase of yield is 106 per cent.

The straw of these plots was not weighed on account of being very weedy.

From previous tests we should unhesitatingly say that four pecks of seed is a sufficient quantity per acre, if the soil is in proper condition and there are no exceptional climatic conditions; the inference is quite plain from the foregoing table that the increased amount of plants per acre acted as a protection and enabled a greater per cent. of the plants to survive.

This, however, is no conclusive argument in favor of thick seeding, as in the case above, nine pecks per acre failed to produce more than one fourth of a crop. To attempt to overcome exceptional climatic conditions by heavy seeding would not be advisable.

Perhaps the only occasion where thick seeding can be recommended is where a farmer so poorly prepares his soil that part of the seed will not have an opportunity to grow, or where poor seed is used.

None of the plots in methods of culture or early and late seeding were harvested. Of the latter, plots sown as late as October 6 stood as well as those sown earlier. Velvet Chaff variety was used throughout all the general work.

SPECIAL STUDY OF VARIETIES.

The Station has not heretofore discussed the origin of wheat or the history of its many varieties, considering it more curious than practical. Much has been done, however, in the way of collecting as many varieties as possible and cultivating them under similar conditions for comparison and study. This we think is of importance and may result in much good. There is no doubt that many of the variety names are local names for the same wheat, or that many of the varieties have come into existence through the local influence of climate and culture, changing the characteristics as to color, etc. The vast number of varieties which could now be collected from different sources in this

country form a babel-like confusion of names out of which one must be well informed to select those few that are most desirable.

Looking at the matter in this light, we have attempted to compare and classify the different varieties which we have grown, with a view of simplifying their nomenclature or at least furnishing lists of approximate synonyms, so that the farmer and seedsman would be able, in a measure, to group those varieties together which are quite similar. We disclaim any intention of setting up a botanical classification which can be recognized by all, for, in fact, the characteristics upon which the grouping rests are so subject to change by selection and climatic influence that even broad groups would need to be frequently revised. Perhaps there may be many varieties cultivated in different parts of the country under names found in our list which would not answer to the description we give them. This only argues the more need that some attempt at classification should be made. Unfortunately, we were not able to carry this study forward as we had hoped this year, on account of losing the trial plots, but the varieties have been resown and the list largely increased.

The two general divisions of wheat into Bearded and Smooth varieties are recognized by all. The grouping here given is based upon color of glumes and berry, and condition of head as to being bearded or smooth. Those which most closely resemble each other in general appearance come at the head of each list and are marked with the asterisk (*). In several cases these are then followed by other names which bear resemblances in color and other points.

FIRST GROUP.

Characteristics.—Glumes awned or bearded, bronze colored, red kernel; head and kernel usually medium or large size.

- | | |
|---------------------------|-----------------------|
| 1. *Australian. | 9. *Red Amber. |
| 2. *Boyer. | 10. *Red Saa. |
| 3. *Buckeye. | 11. *Red Russian. |
| 4. *California Blue Stem. | 12. *Scott's Bearded. |
| 5. *Cornell No. 4. | 13. *Swamp. |
| 6. *Datt Red. | 14. *Tamanian Red. |
| 7. *Lancaster. | 15. *Tuscan Amber. |
| 8. *Mediterranean. | |

SECOND GROUP.

Characteristics.—Glumes awnless or smooth, bronze colored, red kernel; head and kernel usually medium or large size.

- | | |
|---------------------|---------------------|
| 1. *German Amber. | 6. *Red Fulz. |
| 2. *Mammoth Red. | 7. *Siberian. |
| 3. *McGhee's Red. | 8. *Shumaker. |
| 4. *Michigan Amber. | 9. *Southern Amber. |
| 5. *Pool. | 10. Winter Pearl. |

THIRD GROUP.

Characteristics.—Glumes awnless and bronze colored, white kernel; head and kernel usually large.

- | | |
|-----------------------|-------------------------|
| 1. *Clawson. | 6. *Rural No. 5. |
| 2. *Cornell No. 2. | 7. *Shumaker X Clawson. |
| 3. *Lincoln. | 8. Blue Stem. |
| 4. *Royal Australian. | 9. Sandomirka. |
| 5. *White Eldorado. | |

* Those marked with asterisk (*) in third group are very similar in appearance, having in each case almost typical Clawson heads. The others resemble the Clawson only in color.

FOURTH GROUP.

Characteristics.—Glumes awned and white, red kernel; head and kernel usually medium or large size.

- | | |
|------------------------|-----------------------|
| 1. *Alabama. | 8. *Mich Wick. |
| 2. *American. | 9. *Nigger. |
| 3. *Bearded Treadwell. | 10. *Shaffer. |
| 4. *Bennett. | 11. *Theiss. |
| 5. *Democrat. | 12. *Valley. |
| 6. *Egyptian. | 13. *White Blue Stem. |
| 7. *Golden Prolific. | 14. *Wysor's Eureka. |

FIFTH GROUP.

Characteristics.—Glumes awnless and white, red kernel; head and kernel usually small or medium size.

- | | |
|------------------------------|------------------------|
| 1. *Big Frame. | 19. *Small Frame. |
| 2. *Big May. | 20. *Tennessee Amber. |
| 3. *Cornell No. 3. | 21. *White Rose. |
| 4. *Diehl. | 22. *Yellow Blue Stem. |
| 5. *Diehl \times Egyptian. | 23. *Yellow Missouri. |
| 6. *Early May. | 24. *Zimmerman. |
| 7. *Emporium. | 25. Canadian Express. |
| 8. *Emporium Scott. | 26. Champion Amber. |
| 9. *Finley. | 27. Fultz Clawson. |
| 10. *Fultz. | 28. Heckman. |
| 11. *Golden Drop. | 29. Palestine. |
| 12. *Golden Straw. | 30. Rice. |
| 13. *Heighes Prolific. | 31. Rogers. |
| 14. *Hungarian White Chaff. | 32. Scott. |
| 15. *Kentucky White. | 33. Scott's Smooth. |
| 16. *Red Chaff. | 34. Travis. |
| 17. *Red May. | 35. York White Chaff. |
| 18. *Rocky Mountain. | |

SIXTH GROUP.

Characteristics.—Glumes awned and white; white kernel.

- | | | |
|----------------------|------------------|----------------|
| 1. Smith's Improved. | 2. White Rogers. | 3. Wild Goose. |
|----------------------|------------------|----------------|

SEVENTH GROUP.

Characteristics.—Glumes awnless and white; white kernel.

- | | |
|-----------------------|---------------------|
| 1. *Armstrong. | 8. Ostery. |
| 2. *Arnold's Hybrid. | 9. Porter. |
| 3. *Gold Medal. | 10. Powers. |
| 4. *Tappanock. | 11. Rickenbrode. |
| 5. *Treadwell Smooth. | 12. Russian, No. 2. |
| 6. Cornell, No. 1. | 13. Washington. |
| 7. Grecian. | 14. White Mountain. |

The following come under this group according to color, but do not resemble the foregoing varieties much in other respects. Thus they form a group themselves.

- | | |
|---------------------|---------------------|
| 1. *Landreth. | 3. *Silver Chaff. |
| 2. *Martin's Amber. | 4. *White Mountain. |

EIGHTH GROUP.

Characteristics.—Glumes awned, bronze colored, red kernel; heads medium size or large, spikelets arranged in distinctly opposite rows and closely packed on the rachis, giving the head a peculiar square appearance.

- | | | |
|--------------------|--|---------------------|
| 1. Andrews, No. 4. | \| | 3. Michigan Bronze. |
| 2. Brady Lake. | \| | 4. Sibley's Hybrid. |

NINTH GROUP.

Characteristics.—Glumes awnless and white, red kernel; resembles above in arrangement of spikelets, though not so closely set. Number 2 has bronze colored glumes.

- | | | |
|----------------------|-----------------|----------------------|
| 1. American Eclipse. | 2. Canada Club. | 3. Wayne Co. Select. |
|----------------------|-----------------|----------------------|

MISCELLANEOUS.

Roscoe is a peculiar, small square set head, awnless bronze glumes.

There are several varieties called Velvet and Velvet Chaff, these are mostly characterized by a velvety fuzz on the chaff or glumes. They are awned bronze, and awnless white. We have several varieties, but the one of most importance and which the Station has distributed is a red chaff bearded variety with medium size red kernel.

WHEAT TESTS IN DIFFERENT PARTS OF THE STATE.

The Station has for three years endeavored to distribute as widely as possible such varieties of wheat as were thought most promising and not generally distributed. And has also endeavored to obtain the principal facts in regard to their success or failure.

In many cases the parties receiving the wheat have failed to report, and in some instances where they have reported from evident inaccuracies or omission of important facts the reports have been of questionable value.

We wish to say, however, that most of those reporting have done exceedingly well and furnished notes of value.

The selection of men to do local testing for the Station in different parts of the State is a matter of some difficulty as it is impossible for us to have a personal knowledge of but very few of those to whom seed is sent.

Possibly if county societies in different parts of the State would select one or two of their members, who should be considered the special agents of that society to look after work which the Station might wish to have done in their county, it would accomplish a great good in aiding the Station to secure reliable reports and such assistance as is desired.

In the first distribution one bushel of each variety, and usually two varieties were sent to each party. This was found to be quite expensive and it necessitated buying considerable seed which we have learned from experience is not the thing to do. The Station can have no guaranty of the purity of seed unless grown by ourselves, and from the very nature of work it is impossible to grow a large quantity of but one or two varieties. The Station has been imposed upon by persons selling us impure seeds which have not only caused the loss of that particular work, but have been a great injury in other respects.

That the Station should expend much of its means distributing seeds we do not conceive to be the intent of the law by which it was established, yet such work as can be judiciously done in this line is doubtless perfectly proper.

The distribution of wheat for the second year was in smaller quantities than the previous year, and last year entirely in small quantities (two to four quarts), in this manner reaching a much larger number of people. The smallness of quantity we have no doubt deters many from paying such attention to it as it should receive and from making as good a report upon it as they would have done with a larger quantity. But there is no good reason for this. Two quarts of seed will properly sow 10 square rods of ground—one-sixteenth of an acre—and if carefully sown this is sufficient to produce a yield of two or even three bushels, which is ample to produce a crop the following year that will furnish seed for several ordinary farms.

The distribution for last year was sent to over sixty farmers, reaching nearly sixty counties—less than 20 percent. of these reported (or less than one in five). This is a poor showing and just so far deprives the Station of results which it ought to have. If such results are to be expected in the future it is not certain but that the Station must limit testing of varieties to a few paid agents. This would deprive it of means which are very much needed for other work and would not enable us to get as many reports from different sections of the State would certainly be desirable.

In the accompanying table is presented the main facts from this test of varieties. On account of lack of full reports from all parties it is not what we had hoped to present. Wherever any data is omitted from the table it is because the party omitted it from his report. The quantity sown, the area covered, and the yield from that area are given. This affords much better comparison, and shows what diverse results will be reached by different parties. The area sown is not absolutely correct in several instances, but as nearly so as could well be made from data furnished by those reporting. The following general conclusions from the tests and correspondence from different parts of the State are presented:

Fultz wheat, which for a time was waning, is regaining much of its popularity. Velvet Chaff is generally well received, though there are a few adverse reports. Finley is generally well received. York White Chaff and Rocky Mountain are favorably received; also Nigger and Valley. Royal Australian, Martin's Amber and Landreth are good white wheats and as such quite popular.

STATEMENT EXHIBITING RESULTS OF WHEAT TESTS IN DIFFERENT PARTS OF THE STATE.

County.	Party making test	Variety tested.	Soil.	Time of sowing.	Time of ripening.	Amount of seed sown.	Area sown—part of acre.	Amount of grain harvested.	Quality of grain.	Weight per bushel.
Miami	Elias Teefer	Tasmanian Red	Clay	1884. Sept. 20	1885. July 10	8 lbs.	1-10	84 lbs.	Good.	61.
"	"	White Rogers	"	20	13	8 lbs.	1-10	114 lbs.	Good.	61.
Seneca	Bert E. Rice	Velvet Chaff	Clayey loam with gravelly subsoil	17	10	4 lbs.	1-22	75 lbs.	Good.	.....
"	"	Finley	"	17	6	4 lbs.	1-22	86 lbs.	Good.	.....
Miami	M. E. Eidemiller	Rocky Mountain	Black alluvial soil	24	6	9 lbs.	1-8	130 lbs.	Good.	61.5
"	"	Valley	"	24	6	11 bu.	9 acres.	240 bu.	Good.	61.
Sandusky	Wm. Kinney	York White Chaff	Gravelly loam	16	.....	4 qts.	1-16	203 lbs.	Good.	.....
Portage	C. W. Hart	McGhees Red	Clay loam	19	15	4 qts.	1-13	171 lbs.	Good.	62.5
Wood	Joseph Guy	Finley	Heavy Clay	27	18	2 qts.	1-20	91.5 lbs.	Fair.	61.
"	"	Velvet Chaff	"	27	23	2 qts.	1-20	86 lbs.	Fair.	58.
Trumbull	J. W. Woodford	"	.....	22	.....	4 qts.	1-20	105 lbs.	Good.	63.
Highland	J. G. Redkey	Finley	.....	Oct. 8	5	4 lbs.	1-10	98 lbs.	Fair.	.....
"	"	Velvet Chaff	.....	8	2	4 lbs.	1-10	70 lbs.	Good.	.....
Allen	Francis Y. Davis	Royal Australian	Clay loam	Sept. 26	9	2 qts.	1-14	125 lbs.	Very good.	.....
"	"	Nigger	"	26	7	2 qts.	1-14	74 lbs.	Fair.	.....
"	"	Finley	"	26	9	2 qts.	1-14	76 lbs.	Fair.	.....
Seneca	D. T. German	"	Heavy clay	13	11	2 qts.	1-16	75 lbs.	Good.	61.

NOTES FROM THE DIFFERENT REPORTS.

Miami County.—"Wheat was sown after potatoes, ground not thoroughly harrowed and rolled. Clover in 1883; no manure used; yield up to the average, but all had about equal chance."

Seneca County.—"All plots were somewhat injured by ice during winter. Velvet Chaff, straw strong, stooled well, good berry. Finley stood up well, early, white caps, hurt appearance of grain; ground was treated with ordinary coat of manure."

Miami County.—"Wheat sown after clover, no manure. Rocky Mountain stood well, and plump grain. Valley: eleven bushels were sown instead of the small quantity sent by the Station, and yield is given from it accordingly."

Sandusky County.—"York White Chaff was tall and late, but very fine heads." Date of harvesting not given.

Portage County.—"Oat stubble well manured."

Wood County.—"Clover sod, both varieties wintered well. Finley some rusted and Velvet Chaff badly so, late seeding possible cause; yield better than other varieties sown."

Trumbull County.—"Egyptian complete failure from winter killing; Fultz here yielded thirty-five bushels per acre and Finley fourteen."

Highland County.—"Sowed after sweet corn, manured twenty loads per acre, sowed broadcast."

Allen County.—"Oat stubble dressed with horse manure and rotten chips; fifteen loads to the acre."

Seneca County.—"Finley was as nice wheat as I ever saw; straw strong but not harsh."

GENERAL NOTES ON WHEAT CULTURE.

The total wheat production of the United States for the year 1885 was 30 per cent. less than that of 1884, the average yield per acre being about 10.5 bushels.

For the first time in many years the average yield per acre in Ohio has fallen a little below the average for the whole country. This decline is mainly due to the unusual severity of the winter of 1884-5. Specially favored as Ohio is for wheat production, the possibilities being shown by the remarkable average of 19.5 bushels per acre in 1880, it is doubtful under the present system of cultivation whether an equally high average will ever again be reached.

The results following similar methods in other States may be summarized as follows:

In New York during twenty years the average yield has declined from 13 to 10.3 bushels per acre. In Indiana during ten years the decline is from 14 to 10.4 bushels. In Illinois, for the same period, from 14.3 to 10.4 bushels.

These facts are significant if not startling. How is this tendency toward diminished production to be overcome?

There is but one way: Greater care in the selection of seeds; a more thorough preparation of the soil, including better drainage; a careful saving and more generous application of manures. This, and this only, can preserve to Ohio, the rank she now holds as a wheat producing State.

Of the crops usually cultivated and sold in this country, wheat is the most exhausting, yet it may be one of the most profitable.

"In view of the low prices, cheap land and facilities for transportation, would you advise me to give up wheat culture for the present?" is, in substance, a question frequently asked. The Station's answer has invariably been as follows: If your farm yields good crops of wheat, averaging larger now than

they did ten years ago, such crops will rarely fail to return a profit. If your land is too poor to raise a good crop, don't throw away time and money by growing poor ones.

In these times of over production and consequent low prices only good crops will pay. If, baring accident, your wheat crop has regularly increased from year to year, better continue, even though the profit at present is small.

The low prices and general depression in wheat culture mainly affects those who are starving the goose that lays the golden egg. You can't continue to take eggs to market if you will persist in taking the hen along.

As a rule, the risks attending the raising of wheat are greater in other countries than in our own, and in all probability our surplus will soon be needed to make up for failures abroad.

EXPERIMENTS WITH CORN.

In the work with corn the Station has sought to deal with the same general subjects as heretofore. The work has been extended somewhat, especially with varieties. With fertilizers, and in methods of culture, the object has been to study those points of greatest interest from a practical standpoint. For several years the Station has been making a careful study of varieties of corn, but the question of what are varieties is found to be a very perplexing one. That there are five distinct races of corn, as Dent, Flint, Sweet, Pop, and Soft corn, all are well aware. These divisions are quite plainly marked, and can usually be determined with ease by inspection of the ears, and to a certainty, by the structure of the kernel. Whether these divisions should be recognized as species, and the numerous forms and types of ears under each considered as varieties, is a question difficult to answer.

It is true, that these divisions lack some of the points of difference which constitute a species among natural orders of plants, but they have strong points of difference, which, to the agriculturist, makes them in reality species, or possibly the better word is races. They must be considered as distinct species or races if one is to use the term variety when speaking of the different types of each. That there are differences of type and character of growth under each of these five divisions which are worthy of being considered varieties, no one who has studied the subject will doubt. We cite as variety differences the characteristics of color which are found to differ through each race or species, furnishing red, white, and yellow ears, with various mixture of these colors; also eight rowed and many rowed samples, which invariably produce ears true to their type when kept from other varieties. But whether we are to go further with variety differences than is indicated in the above is extremely doubtful. The Station has grown a large number of varieties of corn, and examined carefully many varieties grown elsewhere. Among these there have been many samples of large yellow dent ears, all bearing names, some few of which were well known, but mostly of purely local significance. It is safe to say that out of the large number of so called varieties examined not one half dozen samples could have been selected which could be described as different varieties. What is said of this might be said with equal force of other types. This lack of characteristic differences between so called varieties has led to the desire to put the nomenclature of corn on a better basis. Just how this is to be accomplished is not so easily determined, but the following scheme which has been outlined in previous reports is again presented:

	Races.	Classes.	Types.
Natural species (<i>Zea Mays</i>) {	Dent.....	Yellow.....	1. Large.
	Flint.....	White.....	1. Medium.
	Etc.	Etc.	3. Small.

Under the division of types there is ample scope for variety names, but these should not be applied except to those sufficiently marked to be easily recognized and accurately described.

It is hardly necessary to state that Indian corn is a member of the natural order *Gramineæ* or grass family, and belongs to the genus *Zea*, and to the particular species called *Zea Mays*. Under the classification as given above, we consider the five divisions previously mentioned as races of this species.

With the study of varieties comes another and perhaps more important idea than an attempt at proper nomenclature. It is this: what are the points of an ideal variety and their value? This matter of establishing a standard of excellence would seem on careful thought to be of first importance in the study of varieties.

In attempting such a standard it is but natural that there should be a considerable difference of opinion as to the prominence certain features of a type should have. In setting forth a perfect or ideal ear no reference can be had to characteristics of growth, as ears to stalk, ease of husking, etc., etc.; these are points of the perfect plant, and should, so far as possible, be combined with the perfect ear. The first and prime point in an ear of corn is the nutritive substance that it contains. Hence, an ideal variety should contain a proper proportion of protein carbo-hydrates and fat. From the volume of "Statistics of Agriculture," collected by the tenth census, we copy the following figures:

ANALYSES OF MAIZE KERNEL—DENT VARIETIES.

	Water.	Ash.	Albuminoids. (Protein.)	Fibre.	Carbo-hydrates. (Starch, gum, etc.)	Fats.
Average (26 analyses).....	11.23	1.48	10.49	1.91	70.15	4.74
Maximum	15.24	1.79	11.75	2.95	75.26	6.28
Minimum.....	6.22	1.23	8.05	1.25	66.26	3.80

These analyses doubtless fairly represent the composition of Dent corn, and this discussion is intended to apply to this race only.

In an ideal variety it would be desirable to maintain the maximum amount of albuminoids given in the above table, though it should be done at the expense of the carbo-hydrates. In fact it would seem to be desirable to make corn, which is the great stock food of the country, a more evenly balanced ration. In what measure this could be effected by selection, remains to be seen. Doubtless something might be realized from this source. The Flint varieties, and also the Sweets, show a higher nutritive ratio than the Dents. The determination of the nutritive value of corn is a matter for the chemist and cannot be determined by inspection, but as indicative in this line the kernels which contain the greatest amount of corneous matter are considered to be richest in albuminoids. Passing the matter of chemical composition, let us notice the ear. The matter of first importance here is that it yield as great a per cent. of kernel as is possible without injuriously weakening the cob.

Around this should be grouped the lesser points, which may all be said to culminate in this one. Yet for the purpose of outlining the ideal ear, we ex-

tend the number of points. The values here given are comparative, and if they apply at all are equally suited to corn in Maine or Ohio. Yet, when expressing their values in numbers, it would be necessary to use a different standard for the several great sections of our country which produce corn.

From our examination and study of the Dent corn here at the Station, these values in numbers may be expressed as follows:

Points.	Value of each.
Greatest per cent. of shelled corn	40 points.
Trueness of type	10 "
Evenness of diameters	10 "
Length of ear	10 "
Number of rows	5 "
Size and shape of kernel	10 "
Hardness of kernel	15 "
Total	100 points.

This scale might be considerably extended, but this would be a needless division of the separate values attached to each. This division is ample for all comparison, and all points of interest can be included under one of the above heads. Chemical composition is not included, for the reason that this cannot be determined by inspection. High value is given to the physical character of hardness, with the belief that with this quality goes that of a large per cent. of protein. All analyses which we have studied teach this.

In giving value to the above points, or, in other words, completing our standard for this section, the data is furnished from experience derived at the Station.

We do not take into consideration the matter of color, for it is well proven that chemically there is no difference between these two classes of the Dent race; however, there may be a decided difference observed between two samples grown under unequal conditions, but none on the general average of analyses of samples.

In giving value to those points which relate to the dimensions of ear we must be sure to take dimensions within a given size, which will mature in this latitude. In applying these dimensions to the general crop of any locality, the variations allowed from the standard should be above for localities having longer seasons, and below for those having shorter ones. For this latitude it is safe to assume 110 days for the average corn season, the facts from meteorological observations showing that this is rather below than above the average season.

We here present the accumulated evidences of our study, from which the points of size, etc., for the standard type of ear are selected.

There were forty-four samples of Dent corn used in the Station tests the past year belonging to the white and yellow classes, as follows, 20 of the former and 24 of the latter.

The different points of comparison are best shown by a table:

Basis of comparison.	Average length of ear, inches.	Average number of rows.	Average yield, bushels.	Average weight of cob to bushel of shelled corn.	Average time of ripening.
44 varieties, 24 yellow and 20 white.....	8.6	16	88.6	11.19	Sept. 13.
20 varieties, having an average of 14 rows and less.....	8.7	*14	86.0	11.6	" 12.
24 varieties, having an average above 14 rows.....	8.4	18	91.3	10.8	" 14.
Varieties ripening Sept. 12th and under, 26 in number	8.4	16	81.0	10.6	" 9.
Varieties ripening after Sept. 12th, 18 in number	8.7	16	100.8	12.1	" 18.

In the first instance, the average date of ripening is a little late, being 111 days from vegetation, the extremes of ripening being September 6th and 24th. (Only yellow and white Dents are included in the comparison.) Comparisons can now be made to eliminate this difficulty of date, and also to ascertain the points of greatest development. For example, the comparison of the many rowed sorts with those having fewer rows. This shows the fewer rowed sorts to have generally the longer ears, to yield less per acre, and to have above the average weight of cob, and the ripening to be *but one day* earlier than the average coming just within the limits of 110 days. Per contra the many rowed sorts have a trifle shorter ear, a marked increase in average number of rows, a slight increase in yield, nearly one pound less cob per bushel of shelled corn, and to ripen two days later. This comparison does not bring out the strong points sought for in a division, which shall show wherein lies the best typical variety for selection. Hence, the comparison as to date of ripening; as the basis of this we take the date just 110 days from vegetation, and put all which fall within it in date of ripening into one class, and all which ripen later in another. This comparison brings out the strongest points of any. The average length of the earlier ripening sorts is slightly below the average of all samples; the rows are equal in both divisions of this comparison; the yield of the earlier sorts is considerably less, but this is in part accounted for by the greater dryness of the samples. The weight of cob to shelled bushel is very much less than in the later sorts, and the date falls three days within the limit of time.

Examining this group which ripens within the limit above mentioned, we find the following points of excellence: McCoy corn shows the lowest weight of cob to bushel of corn of all varieties tested; Clarage shows the least weight of stalks to one hundred pounds of corn of all varieties; Munn shows an actual yield of ninety six bushels per acre, or, corrected to perfect stand, one hundred and seven bushels per acre. In all but yield, this group embraces all of the best individual points of any in our test, hence we combine its best results for particular dimensions of ear as follows:

Length of ear, not less than eight inches or more than nine; diameters—butt, $1\frac{7}{8}$ to 2 inches; middle, same; tip, 1 4-8 to $1\frac{5}{8}$ inches; cob should con-

* There were only five varieties having less than 14 rows; this made the average of rows 13.5, but we give it in the table as 14, for it is well known that varieties do not have odd number of rows.

stitute eleven to fifteen per cent. of entire weight, not more; as to number of rows, the evidence is not definite, but all points to the conclusion that they are increased up to a certain limit to the advantage of the ear in yield of shelled corn; just what that limit is can not be given with accuracy, but the evidence seems to indicate that not less than sixteen rows should be required for a standard variety, and that twenty are not detrimental to good results. The size and shape of kernel are very important, but can only be given in words to this effect, that they should be of good depth and such shape as to fill the ear compactly, leaving a smooth surface, free from furrow or sulcus. Hardness of kernel can only approximately be determined by inspection, but the points are that the kernel be well glazed, well filled up at the end, the dent being simply a round dimple or slight longitudinal depression. All wrinkling of the end is to be avoided, as this indicates that the corneous matter does not reach near enough to the surface. The ideal kernel that we should prefer would be wedge-shaped, presenting an almost square end to the surface of the ear.

TESTS OF VARIETIES.

We here present the entire tabulated results of the field tests of varieties, and also the examination for additional study. All weights, except those for yield, were made from samples after being properly dried. The critical examination and study was made from ten average ears selected from the corn as it lay in the field. All plots were planted May 19th, vegetated the 25th, all were given the same care. The season was quite favorable, and though some varieties were very late, they were well matured, and no soft corn is reported.

TABLE I.—GIVING YIELD AND DATE OF RIPENING.

Field number.	Variety.	Total bushels sound corn.	Average ears to each stalk.	Weight of stalks. lbs.	Weight of stalks to 100 lbs. of corn.	Per cent. of ears.	Per cent. of nubs.	Time of ripening.	Yield corrected to full stand.
	<i>Flints.</i>								
63	Large Yellow.....	70.9	.95	5,544	112	85	15	Sept. 1	72.8
64	Compton's Early.....	36.5	.90	2,217	87	70	30	Aug. 25	50.6
65	Long'ellow.....	51.5	1.13	3,234	90	74	26	25	53.8
66	Wauhakum.....	45.2	1.05	3,019	97	74	26	20	54.7
67	Golden Dewdrop.....	50.1	1.21	2,772	80	72	38	25	52.7
68	Top Over.....	43.5	1.05	4,620	151	66	34	Sept. 1	48.3
69	White Flint.....	55.9	1.33	3,326	86	67	33	Aug. 1	60.4
70	King Phillip.....	40.7	1.02	2,310	82	72	28	Aug. 25	46.1
	<i>Dents—Yellow.</i>								
71	Chester Co. Mammoth ..	111.5	1.10	7,140	89	70	30	Sept. 15	123.9
72	*Leaming.....	84.3	.92	5,082	87	58	42	6	91.0
73	Leaming.....	88.7	1.00	4,158	70	70	30	12	93.6
74	Farmers' Favorite.....	105.0	1.02	6,468	88	78	22	24	113.4
75	Golden Beauty.....	51.6	.93	4,158	115	73	27	15	102.8
76	Maryland.....	66.3	.90	2,772	60	69	31	15	86.6
77	Riley's Favorite.....	83.9	1.00	4,158	63	79	21	12	94.4
78	Munn.....	96.0	1.03	4,620	69	88	12	10	107.0

79	Robinson's Golden.....	112.5	.98	6,468	82	73	27	23	117.0
80	Perfection.....	63.2	1.01	3,234	73	51	49	10	70.2
81	Pride of the North.....	70.8	.94	4,620	93	81	19	12	78.6
82	Scott's Dent.....	75.2	.94	4,158	79	78	22	12	82.1
83	Golden Blossom.....	80.8	.93	5,082	90	78	22	12	87.6
84	Hill's Best.....	81.8	1.00	3,696	64	78	22	6	85.5
85	Golden Dent.....	48.3	1.02	2,802	82	72	28	3	69.3
86	Illinois Premium Dent.....	99.3	1.02	6,462	93	84	16	24	109.7
87	Smith's Improved.....	86.1	.94	5,359	90	73	27	8	91.2
88	Thompson Corn.....	68.3	.92	5,082	107	57	43	10	77.3
89	McCoy Corn.....	55.3	.85	4,158	108	61	39	8	61.7
90	Shively.....	72.9	.97	4,804	95	72	28	7	76.6
91	Golden Beauty.....	95.5	.97	8,316	125	79	21	23	99.4
92	Bounds.....	77.5	1.05	3,696	70	76	24	12	99.0
93	Improved Clarage.....	80.8	.95	5,082	90	68	32	12	86.6
94	Willison's Yellow.....	70.4	.92	5,266	107	76	24	12	81.3
95	Clarage.....	92.7	1.5	3,696	60	77	23	7	95.6
96	Small Dent.....	65.3	1.02	3,788	83	63	37	7	69.2
97	Golden Dent.....	37.9	1.03	3,049	116	55	45	15	43.7
115	Ohio Farmers' Choice.....	58.1	1.00	2,956	80	61	39	10	66.2
120a	Orange.....	58.0	.93	4,420	116	74	26	14	69.6
123	Lieurance.....	80.3	.96	3,880	69	69	31	23	83.6
<i>Dents—White.</i>									
95	White Cap.....	62.5	1.07	3,880	90	68	32	6	67.3
105	Number One.....	58.7	.95	3,511	85	56	44	7	62.8
99	Hiawasse.....	108.5	1.07	6,468	83	83	17	23	116.2
100	Mammoth White Surprise.....	96.3	1.03	6,652	99	80	20	14	129.5
101	Boone County White.....	78.6	.85	554	92	71	29	14	98.6
102	Watkins' White.....	103.7	.93	6,006	83	86	14	17	109.4
103	Hampden's Prolific.....	112.3	1.04	5,636	72	71	29	14	116.9
104	Union County White.....	138.6	.83	2,125	80	75	25	12	77.2
106	Horse Tooth.....	115.0	1.12	9,702	121	78	22	25	118.0
107	Champion White Pearl.....	83.1	1.00	4,285	76	71	29	15	85.0
108	Beard's White Pearl.....	86.9	1.05	4,620	76	80	20	7	91.3
109	Pedar's White.....	47.3	.86	2,956	89	65	35	7	51.5
110	Early Dawn.....	84.3	1.00	4,712	80	80	20	10	57.3
122	Custis' White.....	82.9	1.05	3,973	69	77	23	20	92.1

Dents—White.

95	White Cap.....	1.07	3,880	90	68	32	6	Sept.
105	Number One.....	.95	3,511	85	56	44	7	
99	Hiawasee.....	1.07	6,468	85	83	17	23	
100	Mammoth White Surprise.....	1.03	6,652	99	80	20	14	
101	Boone County White.....	.85	554	92	71	29	14	
102	Watkins' White.....	.93	6,006	83	86	14	17	
103	Wampden's Prolific.....	1.04	5,636	72	71	29	14	
104	Union County White.....	.83	2,125	80	75	25	12	
106	Horse Tooth.....	1.12	9,702	121	78	22	25	
107	Champion White Pearl.....	1.00	4,285	76	71	29	15	
108	Beard's White Pearl.....	1.05	4,620	76	80	20	7	
109	Pedau's White.....	.86	2,956	89	65	35	7	
110	Early Dawn.....	1.00	4,712	80	80	20	10	
22	Custis' White.....	1.05	3,973	69	77	23	20	
						</		

TABLE I.—Concluded.

Field number.	Variety.	Total bushels sound corn.	Average ears to each stalk.	Weight of stalks. lbs.	Weight of stalks to 100 lbs. of corn.	Per cent. of ears.	Per cent. of nubs.	Type of ripening.	Yield corrected to full date.
					<i>lbs.</i>				
	<i>Miscellaneous Dents.</i>								
98	Calico	54.9	.97	3,234	84	69	31	Sept. 1	63.1
111	Terrell's Mixed	98.3	.80	4,989	73	58	42	Sept. 15	103.7
112	Bloody Butcher.....	89.6	.96	3,880	62	74	26	Sept. 15	95.4
113	Robinson's Mixed.....	102.6	1.00	5,451	76	78	22	Sept. 24	122.1
114	Speckled	68.4	1.09	3,234	70	65	35	Sept. 10	80.6
118	Pusey's Crossbred.....	62.3	.98	3,696	85	49	51	Sept. 7	67.6
	<i>Softs.</i>								
116	† Maudan Indian.....	.....	.....	.....	.....	.....	.....	Aug. 20	.....
117	Squaw	39.4	.....	2,310	89	66	34	Sept. 7	48.2
119	Clark's Flour .....	.....	.....	.....	.....	.....	.....	.....	.....
121a	R. N. Y. Crossbred	24.7	.....	924	53	44	56	Sept. 1	20.1

* These samples called Leaming were from different sources and quite different type. See descriptive notes.

† These varieties were of low vitality as shown by our test before planting. Only a small per cent. grew in one case.

‡ Only a few small ears, and no yield is given.

§ None matured.

The seed of all varieties was tested before planting, and the amount which vegetated corresponded, so far as observed, very closely with the germination test, but, unfortunately, complete observation on the vegetation of all varieties was overlooked until some of the plants had been removed. Otherwise this would have furnished excellent comparison of the per cent. of vegetation with the germination test.

Table II. presents some important facts in regard to size and weight of ears and cobs.

The length of ear is the average of the variety as grown at the Station the past season.

TABLE II.

Field number.	Variety.	Diameters.			Kernels on average ear.	Rows on average ear.	Length of average ear.	Weight of average ear.	Average diameter of cob.	Weight of average ear.	Weight of average cob.	Weight of corn on average ear.	Number of average ears in bushel of 70 pounds.	Number of average ears in shelled bushel of 56 pounds.	Weight of cob required to make bushel of 56 pounds.	Kernels in one ounce.
		Butt.	Middle.	Tip.												
		Inches.	Inches.	Inches.			Inches.	Ounces.	Inches.	Ounces.	Ounces.	Ounces.			Lbs.	
63	Large Yellow	1 13-16	1 11-16	1 3-16	456	8	11 6-8	9 7-8	1	9 7-8	2	7 7-8	114	114	14	59
64	Compton's Early	1 13-16	1 10-16	1 2-16	597	12	10 3-8	7 4-8	1	7 4-8	1 2-8	6 2-8	149	143	11.2	91
65	Longfellow	1 8-16	1 7-16	1 2-16	371	8	9 1-8	6 2-8	13-16	6-8	6-8	5 4-8	163	163	7.6	73
66	Waushakum	1 7-16	1 7-16	1 2-16	394	8	10 2-8	7 2-8	13-16	7 2-8	1	6 2-8	154	143	8.9	59
67	Golden Dewdrop	1 8-16	1 7-16	1 2-16	392	8	9	6 2-8	14-16	6 2-8	1 1-8	5 1-8	179	175	12.3	68
68	Top Over	1 8-16	1 8-16	1 2-16	346	8	8 4-8	6 5-8	14-16	6 5-8	1	5 4-8	169	159	9.9	38
69	White Flint	1 9-16	1 7-16	1 1-16	394	8	9 5-8	6 5-8	14-16	6 5-8	1 1-8	5 4-8	169	163	11.4	70
70	King Phillip	1 8-16	1 6-16	1 1-16	373	8	8 4-8	5 4-8	13-16	5 4-8	7-8	4 5-8	204	194	10.6	62
<i>Dents—Yellow.</i>																
71	Chester County Mammoth	2 5-16	2 1-16	1 9-16	687	16	9 1-8	13 5-8	1 4-16	13 5-8	2 3-8	11 2-8	82	80	11.9	70
72	Leaming	2 5-16	2 2-16	1 9-16	849	20	8 5-8	13 1-8	1 4-16	13 1-8	2 1-8	11	85	81	10.8	73
73	Leaming	2 1-16	2	1 6-16	784	16	9 1-8	12 3-8	1 2-16	12 3-8	1 7-8	10 4-8	91	85	9.9	77
74	Farmers' Favorite	2 3-16	2 1-16	1 8-16	816	16	9	12 5-8	1 1-16	12 5-8	2 2-8	10 3-8	89	87	12.0	88
75	Golden Beauty	2 3-16	2 1-16	1 8-16	675	14	9 2-8	13 1-8	1 1-16	13 1-8	1 7-8	11 2-8	85	80	9.4	56
76	Maryland	2 5-16	2 2-16	1 11-16	699	16	8 7-8	13 6-8	1 2-16	13 6-8	2 2-8	11 4-8	82	78	11.0	67
77	Riley's Favorite	2 3-16	2 1-16	1 8-16	1020	18	9 2-8	13 4-8	1 3-16	13 4-8	2	11 4-8	83	78	9.8	78
78	Munn	2 3-16	2 1-16	1 6-16	918	20	9	12 6-8	1 4-16	12 6-8	2	10 6-8	88	83	10.4	80

TABLE II.—Concluded.

Field number.	Variety.	Diameters.			Kernels on average ear.	Rows on average ear.	Length of average ear.	Kernels on average ear.	Average diameter of cob.	Weight of average ear.	Weight of average cob.	Ounces.	Ounces.	Weight of corn on average ear.	Number of average ears in bushel of 70 pounds.	Number of average ears in shelled bushel of 56 pounds.	Weight of cob required to make bushel of 56 pounds.	Kernels in one ounce.
		Butt.	Middle.	Tip.														
98 111 112 113 114 118	<i>Miscellaneous Dents.</i>	Inches.	Inches.	Inches.														
		7 5-8	1 15-16	1 6-16	1 1-16	9 3-8	1 2-8	8 1-8	119	110	8.6	88						
		8 6-8	2 1-16	1 8-16	1 3-16	11 6-8	2 9-8	9 6-8	95	92	11.4	68						
		8 7-8	2 1-16	1 8-16	1 3-16	12 6-8	2 1-8	10 5-8	87	84	11.1	93						
		9 2	2 3-16	1 9-16	1 6-16	14 4-8	3 1-8	11 3-8	77	79	15.4	77						
		8 2-8	1 14-16	1 6-16	1 1-16	9	1 3-8	7 5-8	124	118	10.1	80						
		6 5-8	2 2-16	1 9-16	1 4-16	10 6-8	1 7-8	8 7-8	104	111	11.8	87						
116 117 119 121a	<i>Softs.</i>																	
		4 5-8	1 5-16	1 1-16	10-16	2 2-8	2-8	2	498	448	7.0	105						
		9 6-8	1 10-16	1 2-16	15-16	6 6-8	1 4-8	5 2-8	166	171	16.0	67						
		9 3-8	1 8-16	1 4-16	15-16	5	1	4	224	224	14.0	71						
		R. N. Y. Crossbred.....																

* Did not mature.

Especial attention is called to the fact, that, while legally the cob from a bushel of shelled corn is 14 pounds, the average from Station tests of forty-four Dent varieties is nearly three pounds less than this. The samples for this examination were not specially dried, but kept under ordinary conditions.

The foregoing tables furnish a mass of facts which will be more fully discussed in subsequent publications after further observations are completed. A few words here as to variety selection. Probably there are not more than half dozen so-called varieties of the Dent race which are well fixed, and of those few which do seem quite well established, very little can be said in praise. The Station would counsel all interested in establishing a good variety of corn suited to their locality to loose sight of all variety names so far as attaching any peculiar potency to them is concerned, and to select of the corn in their own locality the best possible type, and from this choose seed from the best ears until it is bred to the required standard.

The exchange of seed corn over any wide extent of territory is a mischievous practice, and usually works harm. The idea that several types must occasionally be mixed and planted together to secure a cross, and thus improve the seed is also a very erroneous one. For out of the chaos of types, resultant from any cross, a pure type must again be selected before you are on the road to success. It is a well established fact that the pollen of the individual corn plant does not fertilize the silk of that plant, except to a very limited extent.

The above statements have been verified by repeated observations and tests here at the Station. Improvement "by selection of existing types, and keeping the type pure," are the watchwords of the farmer who courts success.

CROSS FERTILIZATION.

From many tests, conducted specially to investigate this point, the conclusion is reached that well established varieties do not show the effect of cross-fertilization the first year to any appreciable extent. This applies to well established varieties which have long been kept pure from foreign pollen. In no instance has a variety failed to show the effect of foreign pollen in the crop next succeeding the cross, where the plant was deprived of its own variety pollen. Dr. Sturtevant, of the New York Experiment Station, has, by careful tests, shown that a pure bred variety may be exposed to foreign pollen for a succession of years without being affected by it, and has maintained itself pure, to all appearances. This might furnish some basis for an argument that corn could be bred so pure as to resist foreign pollen. However much may be possible in this line, it may be said that much would be gained if a whole community, where the conditions were similar, could adopt a single variety of corn, and by common consent select toward a perfect standard. This would go a long way towards doing away with so many useless sorts, and would make pure breeding possible.

DESCRIPTIVE NOTES OF VARIETIES.

The following sorts grew side by side, and the flow of pollen from one to another was uninterrupted; wherever the effects of current cross-fertilization were observed in this crop it will be given in the notes. The notes are very brief in most cases. Descriptive notes were made from crop planted, and then usually follow notes of crop of this year.

It should be stated here that the kernels of but one ear was used in planting; hence, the difference in type of ear and kernel in the crop is all the more striking.

63. Large Yellow Flint. (Henderson.) A very fair sample of large Flint

corn, heavy at butt, tapers considerably toward the tip. No effects of foreign pollen observed.

(All points, as lengths, diameters, etc., are given in the table.)

64. Compton's Early. (Henderson.) A large Flint, having an average of about 12 rows; kernels small and compactly set on cob; large butt and tapers considerably; no crossing observed.

65. Longfellow. (Henderson.) A fair sample of Yellow Flint. No cross-fertilization observed.

66. Waushakum. (Blount.) Notes as previous one.

67. Golden Dew Drop. (Henderson.) Notes as two previous ones. Crop shows distinctly three types of ear.

68. Top over. (Bragg & Co.) Fine sample, even diameters, peculiar large kernels; crop very untrue to type, and having few typical ears.

69. White Flint. (Henderson.) Only fair; showed two types of ear; crop very much mixed with yellow kernels.

70. King Philip. A very good sample of this variety, even and regular; crop was true in color, but one ear was exactly the type of Compton's Early.

DENTS.

71. Chester Co. Mammoth. (Henderson.) A very fair sample of large Dent; rows quite regular; kernels evenly dented; slightly rough; furrow very slight; pale orange color at end of kernels, and deeper below; cob red, not well filled at tip; crop even and true to type, but has some white kernels.

72. Leaming. (W. J. Mathie.) A fine typical sample of Leaming; heavy butt, tapers considerably; rows quite regular; kernels rectangular, ends evenly dented; furrow almost wanting; bright orange; cob red; crop, rows, and kernels untrue, and some ears not typical.

73. Leaming. (J. K. Bradfute.) Not Leaming, at least not selected after type grown by the originator; a very fair large yellow Dent; rows irregular, tapers considerably in lower third, kernels rectangular, evenly dented and rough; light orange; cob red; crop very much degenerated from sample.

74. Farmers' Favorite. (Henderson.) Fair sample; not well filled at points; slightly tapering, rows regular; kernels evenly dented; part of sample rough, rest smooth on surface; furrow well marked on some and not on other ears; light orange; cob red; crop, coarse, inferior looking corn; rough and mixed with white.

75. Golden Beauty. (E. A. Prior.) Fair, large specimens; rows quite even; not well filled at tip; kernels evenly dented, smooth and flat in shape; furrow slight; pale orange; cob red; crop looks poor and inferior; ears quite true to type; some white kernels.

76. Maryland. (W. M. Woodworth.) Poor sample, ill shaped; tip small and defective; butt large and bulging; rows fairly uniform and straight; kernels evenly dented, slightly rough; furrow slight; pale orange; cob red.

77. Riley's Favorite. (James Riley.) Very fair sample, slightly tapering; rows uniform; kernels evenly dented, good length, very rough; furrow slight; orange above and darker below; cob red; crop fair; two types of ear.

78. Munn. (James Riley.) A good sample; in some characteristics resembling Leaming; tapers some at points; well filled; even, straight rows; kernels evenly dented and smooth; furrow slight; orange color; cob red; crop good; quite true to type; some white kernels.

79. Robinson's Golden. (Wm. Robinson.) A very large sample of corn, with nothing to commend it; uneven, rough; furrow broken; color, light orange, and cob red; crop poor and rough; three types of kernel.

80. Perfection. (A. Woodling & Son.) A very characteristic variety; ears short; thick at butt and well filled; tapering considerably to tips, and well filled there also; rows uneven and irregular; kernels small, many shaped, and unevenly dented; smooth surface; furrow wanting; pale yellow; cob red; crop very true to type; slight trace of cross fertilization.

81. Pride of the North. (James Riley.) Very fair sample; quite uniform diameters; rows even, well filled at points; kernels evenly dented and smooth; furrow slight; bright orange; cob red; crop good, true to type; traces of cross-fertilization.

82. Scott's Dent. (James Scott, Jr.) A very fair sample; uniform diameters; well filled at points; rows even and regular; kernels evenly dented, slightly rough; furrow slight; bright orange; cob red; crop fair; quite true; traces of cross-fertilization.

83. Golden Blossom. (W. M. Woodworth.) Sample only fair; ill-shapen; rows fairly regular; points imperfect as to filling; kernels much resembles Leaming; evenly dented and smooth; furrow slight; bright orange; cob red; crop fair, two types of ear.

84. Hill's Best. (Woodworth.) Only fair; decidedly tapering; tip small and pointed; rows quite even; kernels evenly dented and smooth; furrow slight; orange and deep yellow; cob red; crop good, two types of ear.

85. Golden Dent. (B. P. Mann.) Fair sample; ears not uniform and are tapering; rows are irregular; kernel evenly dented and rough; furrow slight; pale orange; cob red; crop fair, two types of ear; cross-fertilization evident.

86. Ill. Premium Dent. (Vaughan.) Only fair sample; fairly well filled; not of even type; kernels on some broad, evenly dented, slightly rough; on others more rectangular, and not so evenly dented; furrow deep on some, and almost absent in others; light orange and orange; cob red; crop, very fair sample and quite even; traces of cross fertilization.

It should, through all these notes, be borne in mind that the seed was taken from one good ear.

87. Smith's Improved. (Nathan Smith.) Fair sample; quite uniform and even diameters; rows slightly irregular; kernels broad, evenly dented; furrow very slight; orange; cob red; crop fair; type true; traces of cross fertilization.

88. Thompson's Corn. (Lafayette Thompson.) Only fair sample; tips defective; a little uneven in surface; rows irregular; kernels quite even, rough; furrows slight; pale orange; cob light red; crop good; true to type; traces of cross-fertilization.

89. McCoy Corn. (M. H. McCoy.) A very fair sample; tapering slightly, well filled at points; even, regular rows; kernels flat, evenly dented; slightly rough; furrow almost wanting; orange; cob red; two types; traces of cross fertilization.

90. Shively. (G. P. Lozer.) A fair sample; diameters quite uniform; points well filled; rows regular; kernels flat, unevenly dented; little rough; furrow slight; pale orange; cob red; crop fair; two types; traces of cross fertilization.

91. Golden Beauty. (E. R. Walker.) Previously described at 75. This was a smaller sample of same type. It was much advertised, but is apparently unworthy of cultivation.

92. Bounds. (J. M. Allen.) Fair sample; butt heavy; well filled; rows little uneven; kernels evenly dented, slightly rough; furrow slight; bright orange; cob red; crop good; two types; traces of cross-fertilization.

93. Improved Clarage. (Wm. Henderson.) A very fair sample, even, well filled; rows regular; kernels evenly dented; quite rough; furrow slight; pale orange; cob red; crop good; three types of ears; cross-fertilization evident.

94. Willison's Yellow. (Wm. Willison.) Only fair; tapers decidedly; rows regular; kernels unevenly dented and rough; furrow well marked; bright orange and deeper below; cob white; crop fair; three types of ear; cross-fertilization evident.

95. White Cap. (E. A. Prior.) A very fair specimen; tapers a little too much, but is well filled; rows even; kernels evenly dented, slightly rough; furrow wanting; white, or nearly so, orange below; cob red; crop good; true type; cross-fertilization evident.

96. Clamage. (Livingston.) Good sample; well filled at points; even diameters; rows somewhat irregular; kernels flat, unevenly dented; some rough, others smooth; furrow slight; pale orange; cob red; crop very fair; two types of ear; traces of cross fertilization.

97. Small Dent. (E. A. Prior.) Fair; tapers decidedly, but close, well filled; rows irregular; kernels unevenly dented; slightly rough; orange; cob red; crop good; true to type; cross-fertilization evident.

98. Calico. (A. E. Smith.) Sample shelled, and no notes made; crop good; several types of ear represented.

99. Hiawassee. (W. H. Woodworth.) Sample shelled; crop a large White Dent; very fair and true type; cross-fertilization evident.

100. Mammoth White Surprise. (Henderson.) Heavy club looking ears, not well filled at points; rows even; kernels flat, many imperfect; furrows slight; pale white; cob white; crop very fair; true to type, and apparently pure. The crop is much superior to seed.

101. Boone Co. White. (James Riley.) Fair; heavy butts, defective tips; even rows; kernels short, evenly dented, smooth; furrow well marked; pale white; cob white; crop fair; two types; cross-fertilization evident.

102. Watkin's White. (F. M. Watkins.) A good sample; quite even; well filled at points; rows regular; kernels flat, unevenly dented, both rough and smooth; furrows slight; pale white; cob white; crop good; two types; cross-fertilization evident.

103. Hampden's Prolific. (B. L. Bragg & Co.) Only fair; very large butts and tapers decidedly; rows regular; kernels evenly dented; furrow very deep; white; cob red; crop better than sample; true to type, but shows effect of foreign pollen.

104. Union Co. White. (W. M. Woodworth.) Fair sample; quite uniform and well filled; rows regular; kernels evenly dented and rough; pale white; cob white; crop good; on type; evidences of cross-fertilization.

105. Number One. (Seth R. Henchett.) A fine, smooth sample; little defective at tip; rows even; kernels evenly dented; furrow slight; pale white; cob red; crop good; on type; traces of cross-fertilization.

106. Horse Tooth. (A. H. Lindsay.) Fair sample, tapering moderately; rows fairly regular, distinctly set in pairs; kernels flat, evenly dented; furrow deep; pale white; cob white; crop poor, loose stuff; two types.

107. Champion White Pearl. (Livingston.) Fair sample; well filled; rows regular; kernel flat, evenly dented, some rough; furrow slight; pale white; cob white; crop fair; quite true to type; cross-fertilization evident.

108. Beard's White Pearl. (Livingston.) Only fair sample; tapers considerably; faulty at tip; rows even; kernels both flat and rectangular; not evenly dented, some rough; others smooth; furrow slight; pale white; cob white; crop quite good; true type; traces of cross-fertilization.

109. Pedan's White. (D. G. & J. H. Pedan.) Fair sample; very closely filled; rows irregular; kernels unevenly dented and rough; furrow wanting; white; cob pale strawberry; crop good on type; badly mixed with yellow kernels.

110. Early Dawn. (Livingston.) Very fair sample; well filled at points; rows regular; kernels rectangular, evenly dented and smooth; furrow almost wanting; pale white; cob red; crop good; on type, but badly mixed.

Some mixed dents are here omitted, and also some of the white and yellow classes, because sample was shelled, and the crop does not furnish a standard type to describe.

We mention that several varieties of the soft race were grown here this season. But do not consider them of any promise for this latitude. In fact, they are of very doubtful value when compared with the Dent race, even if they could be well grown. The Clark's Flour corn is especially mentioned; none of this variety matured here after having an exceptionally long season.

Also a dozen varieties of Mexican corn were planted. They made enormous growth, some reaching a height of 16 and 18 feet, and were just nicely tasseling when frost put a stop to their growing.

The preceding notes on varieties are of doubtful value, but are given as a part of our study, and to the student of the question may be in a measure useful.

The fact that the Dent varieties produced scarcely any samples pure is worthy of note. Whether these samples had previously been exposed to foreign pollen, we have no means of knowing, but it is very evident that purity of breeding and type is almost unknown among the Dent varieties. With the Flints it is some better.

PLANTING AT DIFFERENT DEPTHS AND DIFFERENT DATES.

This work presents two questions, one as to depth and the other as to date of planting. Previous tests have shown conclusively that the question of depth for ordinary soil and sea on lies between one and four inches, with the evidence tending to favor the shallow planting.

The question of date has not been as thoroughly tested in our work as depth, but the indications are that it is quite as important. The Station hopes in the future to put the inquiry on a better basis, supplementing the work by careful reading of soil thermometers, as well as observations above ground on temperature and rainfall.

While it is duly recognized that atmospheric conditions are not the same on similar dates for different years, yet a study which deals with their absolute condition and its effect upon plant growth are just as important as though the seasons obeyed fixed law.

The following table presents the yields of this year's work as weighed from the field, also corrected yields, and facts relating to development of ear, time of ripening, etc.:

TABLE III.—PLANTING AT DIFFERENT DEPTHS.

Depth of planting.	Planted April 28, 1885.				Planted May 5, 1885.				Planted May 13, 1885.			
	Bushel corn as weighed from field.	Per cent. of ears.	Per cent. of nubbins.	Yield corrected to perfect stand.	Bushel corn as weighed from field.	Per cent. of ears.	Per cent. of nubbins.	Yield corrected to perfect stand.	Bushel corn as weighed from field.	Per cent. of ears.	Per cent. of nubbins.	Yield corrected to perfect stand.
One inch.....	61.5	73	27	66.4	55.2	67	33	56.6	93.0	94	6	94.5
Two inches...	54.6	73	27	60.3	49.8	55	45	54.8	76.2	78	22	79.3
Three inches	54.9	77	23	60.7	50.8	61	39	53.6	71.8	75	25	73.2
Four inches..	.....	.....	.....	.....	.....	.....	.....	.....	63.5	77	23	67.6
Depth of planting.	Yield of stalks per acre.	Stalks to 100 lbs. of corn.	Time of ripening.		Yield of stalks per acre.	Stalks to 100 lbs. of corn.	Time of ripening.		Yield of stalks per acre.	Stalks to 100 lbs. of corn.	Time of ripening.	
	Lbs.				Lbs.				Lbs.			
One inch.....	3320	80	Sept.	1	3237	80	Sept.	1	4924	80	Sept.	6
Two inches...	2508	70		1	2371	70		1	4268	80		6
Three inches	2726	72		1	2307	64		1	2736	54		6
Four inches..	.....	.....	.....	.....	.....	.....	.....	.....	3283	73	.....	6

The important features of the above will be best brought out by giving a comparative table, in which will be included the work for three years. As to date of ripening, early planting did not make a difference corresponding with time of planting. These earlier plots made a fairly vigorous growth, and promised better results than the table shows. The first planting was nineteen days coming through the ground, during which time the temperature averaged 54.2° Fah., and the rainfall was 1.6 inches. The second planting was fifteen days vegetating, average temperature was 56.1°, and precipitation was .83 of an inch. The third planting vegetated in eight days, average temperature 65.2°, precipitation .13 of an inch. On May 25th the plots did not show much difference in appearance.

In the following comparative table for depths and dates of the years 1883, 1884, and 1885, the depths vary from one to three inches.

COMPARATIVE TABLE.

Year.	Average of plantings at different dates—plots up to three inches deep.						Av. of plantings at different depths—up to 3 inches.		
	First planting.		Second planting.		Third planting.		1 inch.	2 inches.	3 inches.
	Date.	Yield.	Date.	Yield.	Date.	Yield.			
1883	May 26	67.8	June 2	67.4	June 9	62.6	86.3	60.8	50.7
1884	May 22	44.1	May 29	36.5	June 5	35.4	36.9	37.4	41.6
1885	April 28	62.1	May 5	55.0	May 13	82.5	72.5	64.8	62.5

As to the best time for planting, it is difficult to draw conclusions from the above table, for dates represent no fixed character of seasons whatever; but let us examine the results at different dates with the character of seasons accompanying each.

For 1883, the planting began late; in fact, after corn usually should be planted in this section, and the study kept in view was depths not dates; however, the results are just as valuable for this comparison.

The character of the spring of 1883 was such that ground could not have been well fitted for planting earlier. The planting was at three dates, with intervals of one week between.

The yields for first and second planting are practically the same, and but slightly in excess of the yield of third planting. The weather, during period of first and second planting, was such as not to promote rapid growth, as the rainfall was excessive, thereby lowering the temperature in the evaporation of moisture. The records of the three plantings plainly show that nothing was gained by planting on May 26th. The planting of June 9th evidently was too late. This is shown more in the soft corn than in total yields.

The planting for 1884 was also begun late, as we were looking more to depths than time of planting.

The weather in relation to the results was as follows: May, a rather cold month, and the rainfall quite abundant, with a cold wave at the close of the month, during which white frost was observed in several places. From the first of June until in September a most severe drouth prevailed. This was very detrimental to late planting, as it did not get rooted before the soil was very dry.

For this year the best yield is decidedly with the earliest planting, and it is to be regretted that some plots were not planted much earlier to better observe the effects of the drouth.

The spring of 1885 was quite favorable to early planting, and, desiring to extend the work in this regard, the first plot was planted April 28th. The ground was in very good shape for this early planting, and also for subsequent plantings. The notes previously given show the character of the weather during the early period of growth of the plots for this season. Plot one remained nineteen days before vegetation; plot two, fifteen days; plot three, eight days. A marked difference, indeed, and the result is plainly evident in the yield, as given in first table of this series.

The difference of yield here is so marked that it affords ground for argument, being over 20 bushels greater than best yield of other plots. The soil

for this series is quite even, and we had reason to suppose was better, if anything, with the earlier plantings. We interpret these results to show that early planting, if followed by cold, wet weather, is very detrimental to the crop; much more so than is generally supposed. Certainly, too late planting should be avoided, but in these days of rapid work with horse tools it would be a paying operation to put extra time on the preparation of soil and defer planting until the season is propitious. With the proper attention paid to selecting varieties, we are certain that the corn season can be brought within one hundred and ten days, and if so, the evidence is against rather than for planting before the 20th of May in this latitude.

A fourth series of plots was planted later than last series given in table, but outside influences rendered their results valueless, except the one and two-inch plots. These showed a yield of 90.5 bushels and 83.3 bushels, respectively. They were planted May 19th. This lends additional force to our argument. These yields were not used in any of the averages.

Next we consider the question of depths. The last three columns in the table of averages give the results quite clearly. These averages are obtained from the plantings at the same depth for the several periods of each year. The general result is unquestionably in favor of shallow planting. To this, however, we notice the quite strong exception of three inches deep for 1884, but the peculiarities of this year have already been given. This difference is undoubtedly due to the drouth which prevailed during that season. If these results are now considered sufficient to sustain an argument, it would be decidedly in favor of shallow planting.

In the first table of this series, which gives the yields of this year, no soft corn is noted. The year was so favorable that all was well matured. The nubbins, however, might be considered unmerchantable grain.

THICK AND THIN SEEDING.

This work is a continuation of previous investigations. The general plan is the same as in former years, though the distances are altered somewhat to suit our study of the question. The two general propositions before laid down constitute the basis of the inquiry. These are: (1.) What area is required to each plant for the best results? and (2) allowing a given area for each plant is it better to group them or place each one separately? The inquiry is based entirely upon product of merchantable corn. The custom of farmers is varied, some maintaining that one practice is better and some another. If this inquiry teaches anything, it is of general application only, being necessary to interpret the mean results according to local conditions of stronger or weaker growth of stalk. The maximum yield of merchantable corn is at no time obtained with that plot which shows the maximum gross yield. This is an important point to those growing corn for feeding purposes, as the distance at which the greater amount of valuable fodder corn can be grown is very often wrongly stated.

The following table gives the complete results for this year. An analysis of this in comparison with work of former years follows.

The rows are all $3\frac{1}{2}$ feet apart, plots planted May 16th, distances gauged by tape line:

Plot.	How planted.	Yield as weighed from field.	Yield corrected to full stand.	Weight of stalks, pounds.	Stalks to 100 pounds corn.	Corn to each stalk, pound.	Per cent. of ears.	Per cent. of nubbins.
1	One kernel 6 inches apart.....	68.3	70.6	4,435	188	.21	27	73
2	" 12 "	79.5	83.7	3,040	122	.55	71	29
3	" 18 "	70.6	71.7	2,584	111	.67	85	15
4	" 24 "	59.6	62.7	1,976	98	.70	83	17
5	Two kernels 12 inches apart.....	78.2	80.3	4,286	170	.22	39	61
6	" 24 "	100.4	105.6	2,584	80	.60	73	27
7	" 48 "	59.5	62.0	2,280	112	.70	82	18
8	Three kernels 18 "	85.6	88.0	3,496	123	.24	43	57
9	" 36 "	79.4	83.2	2,280	85	.45	68	32
10	" 54 "	71.1	74.3	1,724	77	.62	74	27

Before proceeding to the discussion of the previously mentioned conditions, attention is called to the fact that all plots were of nearly perfect stand, as is shown by the slight increase of corrected yield over actual yield. This is a strong point in favor of accepting the results as reliable. None of the plots showed soft corn. All ripened fairly even, and were marked ripe September 6th. Throughout there was an exactness and uniformity in the work and results which greatly enhances its value in regard to the special points to be illustrated.

The examination as to area on which one plant will produce best results, is taken up first.

The plots which for three years have produced best yields of ears are here arranged:

Year.	How planted.	Yield.	Per cent. ears.	Per cent. nub-bins.
1883	One kernel 18 inches apart.....	92.4	70.	30.
1884	" 24 "	41.6	85.	15.
1885	" 18 "	71.7	85.	15.

These plots are not those, in any case, which have produced the greatest yield, and, in some instances, do not show greatest development of ear, but are those in which the two points combined produce greatest yield of ear corn.

The average distance of these plots is 20 inches; for the years 1883 and 1885, the distance is the same, 18 inches, but the season when the extreme drouth prevailed, the distance is increased to 24 inches. For the reason that all results for 1884 are not normal we will omit it from the average hereafter,

though giving it in all of the comparative tables. This would leave the average distance of best results, for marketable corn, 18 inches, and the average yields from these plots 82.1 bushels.

Now, we introduce for comparison with these results those plots of one kernel series for the several years which have produced greatest yield irrespective of development of ear:

Year.	How planted.	Yield, bushels.	Per cent., ears.	Per cent., bushels.	Excess of yield over previous table.
1883	One kernel 9 inches apart.	106.9	34	66	14.5
1884	“ 18 “ ”	43.0	63	37	1.4
1885	“ 12 “ ”	83.7	71	29	12.0

Omitting 1884, the average of distance is $10\frac{1}{2}$ inches, and of yield is 95.3 bushels; the average excess in yield of this table over previous is 18.2 bushels. Between the distances $10\frac{1}{2}$ and 18 inches there doubtless lies the mean of distance for best development of crop in regard to ear, with the indications that it lies nearer the greater distance. Especially is this true if we allow the results for the year of drouth to affect the conclusions. It is very evident that any lack of moisture increases the mean of distance.

As to whether we are to interpret these results as meaning that each stalk of corn requires, say, 15 inches by $3\frac{1}{2}$ feet for its best development, or whether it is at all times necessary to maintain this distance for the free admission of light and sunshine is uncertain. If it is important to have quite considerable interspaces between plants, and the results point in this direction, cannot this be best accomplished by grouping. Two or three stalks in a hill, at a slightly increased distance, more freely admits air and sunshine, and the roots will fully occupy the ground, say at a distance of 24 inches. The increased shading of the ground by this increase in number of stalks is not to be compared with the shade they would cast if distributed along the space.

The argument is made to present the evidence pro and con, not to give opinions.

We will now examine the two series of grouping kernels as to the evidence they present.

The plot producing best yield of ear corn is taken from both the two and three kernel series, for the three years:

Year.	How planted	Yield.	Per cent. of ears.	Per cent. of nub- bins.
{ 1883	Two kernels 24 inches apart	88.7	55	45
{ " "	Three " 36 "	90.0	68	32
{ 1884	Two kernels 30 inches apart	37.0	50	50
{ " "	Three " 30 "	31.3	20	80
{ 1885	Two kernels 24 inches apart	105.6	73	27
{ " "	Three " 36 "	83.2	68	32

The record for plots of 1884 are even more at variance with normal yields in this table than in those previously given. This furnishes additional proof of the correctness of leaving them out of an average which may be interpreted as giving a general law. This year was so exceptional that averaged with so few ordinary years it makes the result unintelligible; whereas, in a long series of years it doubtless should be averaged. This is not to say that the results of that year are valueless, for any accurately kept record has its value, and the teaching of that year is doubtless very valuable as showing probable results from deficiency of moisture. Especial attention is called to the fact that in no instance does the grouping system develop as great a per cent. of ears as the one kernel system does.

It is also quite an important fact that the best results for both series for the years 1883 and 1885 are at identical distances. This tallies with results from one kernel planting. Hence, the average of best results for two kernels gives 24 inches as the distance, and for three kernels 36 inches as the proper distance. The averages of yields are, two kernel series 97.1 bushels; three kernel series 86.6 bushels.

The following table gives the best absolute yields from the same two series of plantings, and for same years:

Year.	How planted.	Yield.	Per cent., ears.	Percent., nub- bins.	Excess in yield over previous table.
{ 1883	Two kernels 15 inches apart	114.2	34	66	25.5
{ " "	Three " 36 "	90.0	68	32	00.0
{ 1884	Two kernels 27 inches apart	40.3	40	60	3.3
{ " "	Three " 30 "	31.3	20	80	00.0
{ 1885	Two kernels 24 inches apart	105.6	73	27	00.0
{ " "	Three " 18 "	83.0	43	57	4.5

The first thing we notice in the above table is that the best absolute yield is, in several cases, the same as best yield of ear corn. Which argues very well for grouping. This is the case for 1883, three kernels 36 inches; 1884, three kernels 30 inches; 1885, two kernels 24 inches. The averages of absolute best yields are for two kernels series, 109.9 bushels; for three kernels series, 89.0 bushels. The average of distance at which they were produced is for two kernel series, 19½ inches; for three kernel series, 27 inches. It should be noted that distances for best absolute yields have not that uniformity noted in best yield of ear corn. We now collect the average obtained from the several comparisons:

Series.	Average yield, bushels.	Average distance, inches.	Average per cent., ears.	Average per cent., nubbins.
One kernel series, best development of ears	82.1	18	77.5	22.5
One kernel series, best absolute yield	95.3	10½	52.5	47.5
Two kernel series, best development of ears	91.1	24	64.0	36.0
Two kernel series, best absolute yield	109.9	19½	53.5	46.5
Three kernel series, best development of ear	86.6	36	68.0	32.0
Three kernel series, best absolute yield	89.0	27	55.5	44.5

The indication of the above comparisons are not to be considered absolute, only relative, but from them there is certainly an important lesson to be drawn, if future work corroborates these results.

First, the best yield of ear corn is found at two kernels, 24 inches apart.

Second, the best yield, regardless of development ear, is found at two kernels, 19½ inches apart.

Third, the least crop of ear corn is with one kernel, 18 inches apart, yet this shows decidedly the highest per cent of ear development. It is rather remarkable that this plot planted with but two-thirds, the seed of best plot should show a yield only about 15 per cent. less.

This result might be taken as in part answering a former suggestion, that it is advantageous to group the kernels; extra cost of seed is to slight a factor for consideration.

A certain distance between hills is absolutely necessary to best development, and a certain grouping seems to add to the possibilities of maximum crop.

Fourth, the maximum crop, both of ear corn and absolute yield, are found in two kernel series, indicate that grouping can be carried to but a certain limit with success. Other suggestions and comparisons might be drawn from the table.

METHODS OF CULTURE.

The pots were all one sixteenth acre each, and planted three and one-half feet each way, May 16th. All were prepared in the same manner, and the plants on all came through very evenly. The cultivation was with Planet, Jr., horse hose, unless otherwise specified. This implement is a fairly successful tool for shallow cultivation, which we consider the true method of cultivating corn.

The table presented below is an addition to former experiments in this line, which was suggested by Mr. H. Underwood, of Paulding County, this State, and we gladly acted on his suggestion. The design is to note the effect of

giving to the crop all the cultivation it receives in the early stages of growth, and of extending the same cultivation over a considerable portion of the season.

Plot.	How cultivated.	Yield of corn from field.	Yield corrected to perfect stand.	Yield of stalks.	Per cent. of ears.	Per cent. of nub-bins.
		<i>Bu.</i>	<i>Bu.</i>	<i>Lbs.</i>		
1	Four times, at ordinary intervals.....	84.5	87.7	4,620	82	18
2	Three times, at intervals of two days	85.0	89.5	4,466	81	19
3	Three times, at intervals of four days	69.0	78.1	3,231	75	25
4	Three times, at intervals of eight days.....	61.8	81.0	2,772	69	31
5	Three times, at intervals of twelve days	80.5	94.0	4,158	86	14
6	Four times, ordinary	80.8	86.3	3,757	85	15

In the above table, as in all previous work, comparisons are based on yield corrected to perfect stand.

The comparison shows nothing except that the yields are remarkably uniform for single plots, and the work shows no difference sufficient to base an argument upon. The two ordinary treated plots, Nos. 1 and 6, are remarkably even, and with the other yields indicate uniformity of conditions.

Plot No. 2 was laid by June 15th, three weeks before ordinary plots were, and yet it seems not to have suffered in yield by so doing. The question might resolve itself into this, as to whether ordinarily corn is not cultivated too much so far as profit is concerned, and, considered in that light, it favors, if anything, views advanced in previous reports: that the limit of profitable cultivation is below what farmers ordinarily believe it to be. The rest of the work in methods of culture follows here, and we wish to state that the soil for this work, as well as for all other corn work, was most thoroughly prepared with Acme harrow and roller. The ground was plowed seven to eight inches deep, in the spring.

Plot.	How treated.	Yield of corn from field.	Yield corrected to perfect stand.	Weight of stalks.	Per cent. of ears.	Per cent. of nub-bins.
		<i>Bu.</i>	<i>Bu.</i>	<i>Lbs.</i>		
1	Cultivated four times, ordinary	80.8	86.3	3,757	85	15
2	Not cultivated at all	7.9	8.8	1,556	9	91
3	Surface cultivation	68.9	91.3	3,080	78	22
4	Cultivated four times, ordinary	71.9	93.5	3,203	74	21
5	Cultivated excessively	74.1	88.4	3,800	75	25
6	Not cultivated at all, drain beneath center of plot	3.5	4.1	1,201	6	94
	Cultivated four times, ordinary; drain beneath the center of plot.....	84.4	96.4	4,004	85	15
	Cultivated ordinary, drain in plot on either side	84.7	102.3	4,004	88	12
	Ordinary, drain beneath plot.....	90.3	102.9	4,620	85	15
10	Cultivated excessively	79.9	88.3	4,800	81	19

This table and previous one formed one consecutive series of plots, and plot 1 of this table is the same as plot 6 of the previous.

Comparing by corrected yields and omitting plots uncultivated, here again is found marked uniformity of results. Plots six, eight, and nine show the best yields. This might be attributed to the tile drainage.

Their average is 100.5 bushels per acre, and the average of other plots is 89.6 bushels per acre. The yields from uncultivated plots is too small to be noticed. The first uncultivated plot was under ordinary treatment last season, and yielded as well as other plots.

The second uncultivated plot, No. 6, has been so treated for three years. This plot has a drain beneath it the same as No. 7. The growth of weeds on both uncultivated plots was very abundant.

It should be noticed that surface cultivated plot is above the average of undrained plots. The work on this plot was done with a light small tooth harrow.

Plots five and ten were to have been cultivated excessively with shovel-plow, considerably deeper than ordinary cultivation, but storms bent the stalks down so it was impossible to carry out the plan without doing injury aside from deep late cultivation. They received one cultivation after the ordinary work had been laid by. This was about the time of fully coming into tassel. These two plots are among the lowest yields; however, there is not difference enough for an argument.

If extending the cultivation late into the season, as many farmers do, is of no value, it is important to know it; conversely, if thorough preparation of the soil and cultivation of the young plant produces as good crop as more extended cultivation, it is an important fact; also, if light shallow cultivation of the surface produces as good crop as heavy deep cultivation, it is important that the farmer should know this.

The abundance of moisture during the past season made observations on the ability of cultivated soil to withstand drouth of little importance.

For the years 1883 and 1884 the best yields were from plots cultivated twice.

We state here that this soil was cropped for four years successively without manure. Last spring a good coat of manure, about twelve tons per acre, was plowed under.

Ridge culture was an entire failure the past season. We think that the extra labor involved with this method of planting entirely overcomes any theoretical advantage which may be claimed for it, and, further, from experience here, it is absolutely impracticable with any implements yet tried.

APPLICATION OF FERTILIZERS.

The fertilizer work is altered in some particulars from previous years' tests, but is on the same general plan.

Explanatory remarks about the size and conditions of the plots have been given in previous reports, but are here repeated in part. The plots are one-sixteenth acre each, being about sixteen rods long and ten and one half feet wide. This allows three rows three and one half feet wide to each plot. The distance between plots is seven feet. The field is not exactly square, hence the size of plots has to conform to it and are as given above. This size of plot gives as nearly conditions of field work as plot experiments can be. The plowing is done crosswise, and due care is observed not to displace the soil from the plots. The division of the field where this work is conducted, embracing nearly four acres, has received no fertilizers, except those specially applied and noted in the tables, since 1881. The work the past season was accomplished under exceptionally good conditions.

The proper interpretation of plot experiments is a matter of much difficulty,

and the object sought is to present as many facts as possible, leaving the theorizing and summing up for the future, when our absolute knowledge of the subjects should be more complete.

It is evident that differences noted between two plots for one year teach but little, and that all results of value must be averages of duplicate plots, for the same year and for different years. All opinion about the matter, unless subjected to the most rigorous test as to matters of fact, is of no avail.

Appearances are especially deceiving where fertilizers are used, and only facts obtained by careful weighings and examinations are to be relied upon.

The following table presents the record of the plots for this year:—

Plot.	Kind of fertilizer.	Yield of corn as weighed from field.	Yield corrected to perfect stand.	Yield of stalks.	Stalks to 100 lbs. of corn.	Per cent. of ears.	Per cent. of nubbins.
		<i>Bu.</i>	<i>Bu.</i>	<i>Lbs.</i>	<i>Lbs.</i>		
1	Nitrate Soda.....	82.8	85.9	3,952	70	85	15
2	“.....	78.5	81.7	4,104	75	79	21
*3	Unfertilized.....	90.1	92.6	3,897	64	82	18
4	Muriate Potash.....	85.0	87.4	4,560	80	75	25
5	“.....	84.2	88.0	4,651	80	79	21
*6	Unfertilized.....	80.8	84.2	3,800	70	77	23
7	High grade Superphosphate.....	75.5	76.7	3,640	70	92	8
8	“.....	74.7	76.7	3,891	75	60	31
9	“.....	77.1	79.4	3,800	70	72	28
†10	Unfertilized.....	77.4	80.1	3,253	60	76	24
11	Sulphate of Ammonia.....	78.8	82.6	3,800	68	74	26
12	“.....	75.7	78.9	3,715	70	78	22
†13	Unfertilized.....	79.4	82.4	3,496	63	80	20
14	Nitrate Soda in hill.....	78.4	82.9	3,890	71	79	21
15	Muriate Potash in hill.....	88.5	104.2	4,964	80	85	15
†16	Unfertilized.....	93.5	103.7	4,979	80	84	16
17	Sulphate of Ammonia in hill.....	72.9	88.3	3,800	75	77	23
†18	Unfertilized.....	96.8	103.1	4,955	73	85	15
†19	“.....	89.0	101.6	3,499	72	85	15
20	Hen manure.....	88.8	99.4	4,773	77	78	22
21	Compost.....	89.7	105.9	5,016	80	89	11
22	Horse manure, fresh.....	97.5	104.0	5,320	77	86	14
23	Special manure.....	80.2	86.5	5,928	106	78	22
24	“.....	83.5	97.7	5,168	90	86	14
†25	Unfertilized.....	88.5	96.6	5,168	83	83	17
†26	“.....	80.2	85.9	3,952	70	68	32
27	Guano in hill.....	74.6	91.0	4,408	84	77	23
28	Guano broadcast.....	79.5	97.8	4,621	83	63	37
†29	Unfertilized.....	74.8	85.9	3,952	75	73	27
30	Salt.....	69.2	84.7	3,648	75	68	32
*31	Unfertilized.....	75.1	86.2	3,800	72	70	30
32	Wood-ashes.....	84.0	94.8	3,648	62	75	25
33	Tobacco stems.....	81.6	96.3	3,738	65	78	22

* Unfertilized for two years past.

† Unfertilized for whole time of experimentation.

‡ Unfertilized for one year past.

The above table offers no grounds for comparison. The yields are exceptionally uniform. Had it been our intention to produce duplicates, we doubt if this record could have been excelled.

Particular attention is called to the fact that corrected yields but slightly exceed actual yields, showing that the stand was nearly perfect. The exceptions noted to this is where concentrated fertilizers were used in the hill and also guano and salt broadcast. We are quite thoroughly convinced that fertilizers should be applied broadcast.

During the summer, plots treated with high grade superphosphate and special corn manure gave promise of better crops than others, and all fertilized plots promised better results than the unfertilized, but the weights of corn showed this to be delusive. The fertilized plots show almost uniformly a greater weight of stalks than the unfertilized.

If these applications after being tested thus carefully, show no benefit worthy of notice, is it not best that the farmer should invest carefully in high priced special manures for corn? Special manures are not condemned, because it is well known that under some conditions they are beneficial. It is more than probable, however, that much money is thrown away upon them.

The failure to produce satisfactory results from the use in good form of what is known to be the essential elements of fertility will only induce all interested to prosecute the work with more care.

We wish to further add here that the fall of 1881 and previously this land had been bountifully treated with stable manure, much of the fertility of which doubtless yet remains in the soil; and that the application of the fertilizers during the past three years has, without doubt, added somewhat to this fertility. The general crop for 1885 was considerable better than 1883. And added to other things, the high tillage that it has had during these trials has put it in condition to produce a maximum crop.

The following table gives a complete summary of the kinds and amounts of the different fertilizers used for the past three years, and a summary of the yields. It is worthy of careful study:

SUMMARY OF THE KINDS AND AMOUNTS OF FERTILIZERS USED.

Plot	Treatment of each plot for two years previous to 1885.	Treatment for 1885.	Accumulated quantity of fertilizers during 3 yrs.	Remarks.	Yields for three years, corrected to perfect stand.		
					1883.	1884.	1885.
1	Nitrate of soda, 300 lbs. in hill each year.....	Nit. of soda, 300 lbs. broadcast.....	Nit. soda, 900 lbs.....	Applied consecutively during the three years.....	69.4	23.7	83.9
2	Same, 300 lbs. broadcast each year.....	Same, 600 lbs. broadcast.....	Nit. soda, 1200 lbs.....	Applied during the three years; one-half the last year.....	68.0	29.1	81.7
3	Same, 600 lbs. broadcast in 1883; unfertilized in 1884.....	Unfertilized.....	Nit. soda, 600 lbs.....	All applied the first year.....	66.7	23.9	92.6
4	Muriate of potash, 300 lbs. in hill each year.....	Muriate of potash, 300 lbs. broadcast.....	Mur. pot., 900 lbs.....	Applied consecutively during the three years.....	67.1	20.4	87.4
5	Same, 300 lbs. broadcast each year.....	Same, 600 lbs. broadcast.....	Mur. pot., 1200 lbs.....	Applied during the three years; half the last year.....	68.4	30.9	88.0
6	Same, 600 lbs. broadcast in 1883; unfertilized in 1884.....	Unfertilized.....	Mur. pot., 600 lbs.....	All applied the first year.....	67.9	28.1	84.2
7	South Carolina rock phosphate, 200 lbs. in hill each year.....	High grade superphosphate, 200 lbs. broadcast.....	{ S. C. rock, 400 lbs H. G. superphos., 600 lbs.....	{ First item applied first two years, and second the last year.....	66.1	24.3	76.7
8	Same, 200 lbs. broadcast each year.....	Same, 600 lbs. broadcast.....	{ S. C. rock, 400 lbs H. G. superphos., 600 lbs.....	{ As previous.....	65.3	21.4	76.7
9	Same, 400 lbs. broadcast each year.....	Same, 800 lbs. broadcast.....	{ S. C. rock, 800 lbs H. G. superphos., 800 lbs.....	{ As previous.....	66.7	26.0	79.4
10	Unfertilized both years.....	Unfertilized.....		Has received no fertilizer since 1881.....	41.3	28.1	80.1
11	Sul. of ammonia, 200 lbs. in hill each year.....	Sulphate, ammonia, 200 lbs broadcast.....	Sul. amm., 600 lbs.....	Applied during the three years.....	52.6	21.4	82.6
12	Same, 200 lbs. broadcast each year.....	Same, 400 lbs. broadcast.....	Sul. amm., 800 lbs.....	As previous, one-half amt. last year.....	50.7	33.4	78.9
13	Same, 400 lbs. broadcast each year.....	Unfertilized.....	Sul. amm., 800 lbs.....	Applied during first two years.....	42.8	24.7	82.4
14	Nitrate of soda, 300 lbs. in hill each year.....	Nitrate soda, 300 lbs. in hill.....	Nit. soda, 900 lbs.....	Applied during the three years; S. C. rock omitted last year.....	58.3	32.3	82.9
15	Same, 200 lbs. broadcast each year.....	Mur. of pot., 300 lbs in hill.....	{ S. C. rock, 400 lbs Mur. pot., 900 lbs.....	{ As previous.....	75.0	30.4	104.2
16	Muriate of potash, 300 lbs. broadcast e'h y'r.....	Unfertilized.....	Mur. pot., 600 lbs.....	Applied during first two years.....	62.8	35.8	103.7
17	Nitrate soda, 30 lbs. in 1883; 200 lbs. in 1884; broadcast each year.....	Unfertilized.....	Nit. soda, 500 lbs.....	Applied during the three years; S. C. rock omitted last year.....	63.5	33.7	88.3

SUMMARY OF THE KINDS AND AMOUNTS OF FERTILIZERS USED.

Plot.	Treatment of each plot for two years previous to 1885.	Treatment for 1885.	Accumulated quantity of fertilizers during 3 yrs.	Remarks.	Yields for three years, corrected to perfect stand.		
					1883.	1884.	1885.
18	Same as above, with 300 lbs. muriate of potash added, broadcast each year.....	Unfertilized.....	{ S. C. rock, 400 lbs. Sul. am., 400 lbs. }	{ Applied during first two years..... Same as No. 10	73.5	35.1	103.1
19	Unfertilized both years.....	Unfertilized.....	{ Mur. pot., 600 lbs. }		72.1	43.7	101.6
20	{ All b'd't for '83; unfertilized for '84	Hen manure, 3 tons b'd't	{ S. C. rock, 200 lbs. Sul. am., 200 lbs. Mur. pot., 300 lbs. Nit. soda, 30 lbs. Hen manure, 3 tons		72.3	42.9	99.4
21	One-half of above each year, broadcast.....	Composted horse manure, 16 tons b; eadcast	{ S. C. rock, 200 lbs. Sul. am., 200 lbs. Mur. pot., 300 lbs. Nit. soda, 300 lbs. Horse manure, 16 tons composted. }	{ Minerals applied during first two years; manure for 1885	73.7	56.7	105.9
22	One-third of No. 20 for 1883, and one-fourth for 1884, broadcast.....	Fresh horse manure, 16 tons broadcast	{ S. C. rock, 116 lbs. Sul. am., 116 lbs. Mur. pot., 175 lbs. Nit. soda, 175 lbs. Horse manure, 16 tons fresh..... }		79.2	54.3	104.1
23	Special corn manure, 300 lbs., in hill both years	Special corn manure, 300 lbs., in hill	Special manure, 300 lbs.....	{ Applied during the three years..... Applied during three years, one-half last year	92.6	53.5	86.5
24	Same, 300 lbs., broadcast both years	Same, 600 lbs, broadcast.....	Special manure, 1,200 lbs		87.8	55.3	97.7
25	Same, 600 lbs., "	Unfertilized.....	Special manure, 1,200 lbs		93.0	60.1	96.6
26	Unfertilized both years.....	"	{ Gypsum, 1,000 lbs. { Guano, 200 lbs... }	{ Applied during first two years..... Same as No. 10	104.4	54.4	85.9
27	Gypsum, 500 lbs., in hill.....	Guano, 200 lbs., in hill.....	{ Gypsum, 1,000 lbs. { Guano, 200 lbs... }		98.8	54.9	91.0
28	Same, 500 lbs., broadcast	Same, 400 lbs., broadcast	{ Gypsum, 1,000 lbs. { Guano, 400 lbs... }		84.0	51.7	97.8
29	Same, 1,000 lbs., broadcast	Unfertilized.....	{ Gypsum 2,000 lbs.. }	{ Applied during first two years.....	67.4	44.5	85.9

30	Lime, 50 bushels, in hill for 1888; agl. salt, 500 lbs., broadcast for 1884	Agricultural salt, 500 lbs., broadcast	{Lime, 50 bush., Agricultural salt, 1,000 lbs., Lime, 50 bushels ..}	Lime first year, salt last two years ..	72.3	42.3	84.7
31	Lime, 50 bushels, broadcast for 1888; unfertilized for 1884	Unfertilized		Applied first year	75.2	44.3	86.2
32	Wood ashes, 40 bushels, in hill both years ..	Wood ashes, 50 bushels, broadcast	Wood ashes, 130 bushels	Applied during the three years	72.2	32.9	94.8
33	Same, 40 bushels, broadcast both years	Ground tobacco stems, 500 lbs., broadcast	{Wood ashes, 80 bushels, Tobacco stems, 500 lbs.}	Wood ashes first two years, tobacco stems last year	57.8	39.6	96.3

REPORT ON OATS.

Nineteen varieties of oats were grown at the Station the past year, in 1 32 acre plots. No yields are given from smaller plots.

The soil is a clay loam, moderately fertile. It had been cropped for four years without fertilizers until this season, when superphosphate was applied, broadcast, after the oats were through the ground, at the rate of two hundred pounds per acre.

The ground was plowed April 13th, but frequent rains prevented sowing until the 23d. Then the soil was in excellent condition, having been thoroughly pulverized with the Acme harrow and the roller. All plots were sowed at the rate of two bushels per acre, with the Buckeye drill. The seed vegetated slowly, and the plants were not fully through the ground until May 6th, but the stand was almost perfect, and the growth was very strong during the entire season.

The varieties all stood up so well that observations on strength of straw were of no particular value. It should be noted though in this connection, that varieties which were not harvested previous to July 22d were badly lodged by a storm on that date. This storm was preceded by several days of hot weather, which, in connection with it, may have injured these varieties somewhat, especially as regards weight per measured bushel. No variety ripening after this date weighed up to the standard bushel of thirty-two pounds.

In the following table a bushel is thirty-two pounds, and the weight of a measured bushel means the quantity contained in a sealed measure.

Plot.	Variety.	Yield in bushels per acre.	Weight per measured bushel, lbs.	Yield of straw per acre in lbs.	Date of ripening.
1	White Russian	55.0	31	3,744	July 28
2	White Russian Improved.....	53.2	30	4,576	28
3	Yankee Prolific	68.5	31	4,608	28
*4	American Triumph.....	34.5	29	2,936	29
5	Barley Oats	80.5	37	8,160	20
6	Bohemian	51.2	40½	3,872	20
7	Clydesdale	78.0	38½	3,328	20
8	Early Dakota.....	71.5	31½	3,520	22
9	Early Prize Cluster	59.8	37	2,944	20
10	Kansas Hybrid.....	72.8	34	3,488	22
11	White German.....	80.2	30½	4,192	20
12	White Schoener.....	82.8	30	3,552	24
13	Monarch	76.0	29½	3,392	24
14	Race Horse	84.5	31½	4,704	18
15	Rust Proof.....	73.5	29	3,648	22
16	Welch	65.5	28	3,328	24
17	Welcome	78.5	35	3,968	20
18	White Canadian.....	64.8	30½	3,968	24
19	White Belgian	74.0	34	4,160	22

* This plot suffered by being too close to the road; injury estimated at about ten per cent.

The yields of the above plots are quite large, considerably exceeding those of last year on the same plots. The application of the light dressing of super-phosphate may have helped to produce this result, but it is probable the better climatic conditions of the past year had more to do with it. We have not tried using special fertilizers on oats, but from experience with the other grain crops, the above conclusion is drawn. The season of 1884 was marked by a severe drouth, which materially reduced the yield of all the experiment crops, except wheat, which was out of the way. The season of 1885 was quite favorable in this regard.

These yields are not beyond the reach of the thorough farmer, as is well known from experience. The average is about $68\frac{1}{2}$ bushels per acre, while the average of the crop for the State in 1884 was 29.8 bushels per acre, some counties reaching a little over 40 bushels.

Seed plays a very important part in the yield of the oat crop—perhaps more than in any other cereal. The native locality of this plant, so far as known, is in a cool, moist climate, and it seems to deteriorate quite rapidly when taken to warm latitudes subject to extremes of temperature and drouth.

Below are given a few figures in support of this conclusion. Only those varieties are used which have been grown here for two years, the seed for crop of 1885 being taken from the crop of 1884.

Variety.	Yield of grain, 1884—bushels.	Yield of grain, 1885—bushels.	Weight of bushel, 1884—lbs.	Weight of bushel, 1885—lbs.
American Triumph	60.0	*34.5	31.0	29.0
Rust Proof	57.3	73.5	30.0	29.0
Welcome	69.5	78.5	39.5	35.0
White Belgian	68.5	74.0	36.5	34.0
White Canadian	63.3	64.8	33.0	30.5
White German	65.3	80.2	32.0	30.5
White Russian	59.3	55.0	31.0	31.0
Welch	56.7	65.5	32.0	28.0

* Injured by position.

This table shows a decided increase of crop with nearly as decided decrease in quality. The weight is considered the true index to the quality of the crop. The increase in crop has already been mentioned. The seed-oats for the crop of 1884 were obtained, with but one exception, from northern grown stock. This exception was the Welcome, the seed for which was grown in northern Ohio the season of 1883. The deterioration this variety has undergone since coming into our hands is very noticeable, the grains being much smaller, and having a decidedly inferior look compared with the seed when we received it, and inferior to our first crop. The variety had just been introduced in the spring of 1883, and showed decidedly vigorous qualities.

In the above table all the varieties show a reduced weight per bushel in 1885, except White Russian. All but two, American Triumph and White Russian,

show an increased product over crop of 1884. The first was badly situated ; the latter was apparently as well situated as any of the plots.

From these figures and other well established observations, it seems to be a matter of prime importance where our seed oats are grown. We intend pursuing these observations more carefully in the future.

The following table gives some figures showing weight of straw to grain, and other facts in regard to the development of the several varieties.

Plot.	Variety.	Pounds of straw to one of grain.	Length of straw in inches.	Average number of kernels in ten heads.	Maximum.	Minimum.	Color and appearance of grain.
1	White Russian	2.1	43	73.5	102	44	White, long.
2	White Russian Improved	2.7	44	68.3	96	45	"
3	Yankee Prolific	2.1	45	88.2	112	43	White, slender, long.
4	American Triumph	2.7	42	92.7	120	68	White, long, fairly plump.
5	Barley Oats	3.2	39	62.3	81	42	White, medium length, quite plump.
6	Bohemian	2.4	39	65.2	85	49	Buff, small, spongy, hullless.
7	Clydesdale	1.3	37	61.2	86	44	White, medium length, plump.
8	Early Dakota	1.5	40	55.9	78	33	White and brownish, long, slender, very chaffy.
9	Early Prize Cluster	1.5	41	55.7	70	36	Light, buff, medium length and plump.
10	Kansas Hybrid	1.5	40	49.2	93	31	Buff and dark, long and chaffy.
11	White German	1.6	37	71.9	92	50	White, good size.
12	White Schoener	1.3	42	71.2	100	49	"
13	Monarch	1.4	41	90.5	104	69	"
14	Race Horse	1.7	38	58.0	102	39	White, medium length and plump.
15	Rust Proof	1.6	38	42.7	58	36	Buff and dark, long, slender, chaffy kernels and awned.
16	Welch	1.6	40	80.6	106	56	White, good size.
17	Welcome	1.6	40	54.4	65	40	White, small, short and plump.
18	White Canadian	1.9	43	66.5	80	54	White, long, good size.
19	White Belgian	1.8	40	54.4	75	33	White, long, slender.

The foregoing table expresses the important points as to the development of the different varieties, and is also somewhat descriptive.

The first three varieties were so nearly identical that no one could have recognized them as being different. They are what are commonly called side oats, the branches of the panicle all turning to one side.

No. 5 is a very vigorous, leafy plant, not above average height.

All but the first three have a spreading panicle, and those which bear white grains closely resemble each other; those bearing dark grains resemble the others, except in color of kernel.

Some of these varieties are of very doubtful origin, but we give them with the names by which they were received. It is hardly necessary to say that those showing best yield with good weight per bushel are the most valuable, and it will pay farmers to purchase these varieties if they can get them of reliable parties at prices within limits of farm profits.

The name Rust Proof has no significance, as this sort is as subject to rust as any other. It is a rather peculiar, low growing variety, with abundance of leaves about the base.

The Bohemian resembles much in outward appearance the other varieties, but belongs to a different species. Of this we will speak again.

The varieties were carefully noted in regard to stooling, but the notes were not of sufficient importance to insert figures which have a very doubtful value in the table.

The largest number of stalks found growing from one seed was six, and all of the varieties stooled some, averaging two to four stalks to the seed. The Welcome, which grew such strong, heavy stalks last year, and was not observed to stool at all, grew smaller stalks this year and stooled slightly. The variations which are constantly observed in varieties lead us to doubt more and more the value of descriptions, except those which are based on the most obvious differences of structure, color, etc., and these descriptions should be very simple.

Just before harvesting nearly all of the varieties showed traces of smut (*Ustilago segetum*, Pers.), but the extent of the disease seemed so much greater in some varieties than in others that it led to an examination each variety separately. Portions of the Plots were selected indiscriminately, and the total number of stalks counted, noting the number affected, from which is given the following per cent. of smutted heads.

Variety.	Seed.	Per cent. of smutted heads.
White Russian.....	Station seed	6.2
White Russian Improved.....	Western seed	4.3
Yankee Prolific	North Pennsylvania seed	4.4
American Triumph.....	Station seed	9.5
Barley Oats.....	Western seed.....	2.8
Bohemian Oats.....	Northern seed	0.4
Clydesdale.....	"	0.7
Early Dakota	Western seed.....	0.5
Early Prize Cluster.....	"	1.5
Kansas Hybrid.....	"	Trace.
White German.....	Station seed	22.6
White Schoener.....	"	2.8
Monarch	Northern seed	13.4
Race Horse	"	0.2
Rust Proof.....	Station seed	2.4
Welch	"	14.0
Welcome	"	7.5
White Canadian	"	8.6
White Belgian	"	6.7

We offer no suggestions as to why one variety should be more affected than others except that, as is well known, plants vary in their ability to resist disease.

There is no remedy known for the prevention of this fungus growth. The spores are supposed to be present in all places, and develop or not as conditions favor or hinder. There is, however, this practical suggestion, that seed from vigorous plants, and well-drained, properly prepared soil will tend very much to diminish its possible opportunities for growth.

We do not believe that the locality where seed is grown, considered aside from its vigor, has anything to do with its ability to resist the growth of smut.

The above figures show that the loss from this cause is quite severe at times, and it is frequently greater than is supposed.

On the river bottom of the University farm a piece of oats was sown very thick for oat hay; the soil was low undrained alluvial deposit, and the seeding was about twice what would be sown for a crop. This piece produced fully three-fourths smut heads, nearly destroying its value as food. This instance is simply given to show that such surroundings are not favorable to the healthy growth of oats. Further, it is probable that had they been sown much thinner the crop would not have been so badly affected.

We consider two bushels, if properly sown, abundant seed per acre for growing a crop of grain, and would not sow over three for hay crop.

BOHEMIAN OATS.

It might be expected, in view of the extraordinary methods which have been resorted to in all sections to introduce this species of oats, that we should make some special mention of it here.

The common oat is botanically *Avena Sativa* L., to which all of our cultivated varieties which have the seed enclosed in the flowering glumes belong.

The Bohemian oat belongs to a different species, *Avena Nuda L.*, in which the grain is naked, and when ripe hangs protruding slightly from the flowering glumes.

The berry is small, of a buff grayish color, soft and spongy. Of its origin we know nothing more than that it has always been cultivated more or less along with the common oats.

Whatever we have been able to learn of its existence in Europe, it is not well spoken of, being cultivated occasionally for its grain, but not highly esteemed, regarded rather as a degraded variety of *Avena Sativa*.

As to its introduction as a grain of special importance by so called Bohemian oats associations, the whole thing is an unprincipled scheme simply to make money by fraud and deception. Its value commercially is not greater, and probably not equal to common oats.

The universal testimony of millers is that it is not so good for milling purposes as the best white oats.

The whole scheme of buying and selling them at \$10 per bushel rests simply on the ability of some slick agent to secure a respectable farmer as a stool-pigeon for the first year, and this enables him usually to do a paying business, the second year after which he usually decamps, and Bohemian oats are a drug in the market at any price. No one grows them after that.

The whole scheme has been so frequently shown up that we deem it unnecessary to enter into details. Farmers are not deceived very often or made to believe that these oats have a special commercial value, but the agent makes it appear that he has sold Mr. B's crop for so much, and doubtless he has; the result is, that only too often the idea of getting much for little or nothing "staggers the good intentions of honest farmers."

There are several wheat schemes being worked in the State on precisely the same plan as this oat scheme.

EXPERIMENTS WITH POTATOES.

The tests with potatoes for the past year is a continuation of previous work.

The list of varieties has been considerably extended, and an attempt has been made to make the test of methods of culture more complete. The work, as a whole, was very successfully executed, and adds the record of another year as evidence on the questions at issue.

The ground for all the work was prepared with the care of a garden bed; that for varieties having a heavy coating of compost plowed under; the part for fertilizer work was not treated with compost or other manure, only as mentioned in the table. After planting, the varieties were also treated with special potato manure at the rate of 400 pounds per acre. All cutting is two eyes to the piece, unless otherwise specified, and planted $2\frac{1}{2}$ by 1 foot in the row, and four inches deep, unless stated differently in the table. The culture for all the general work was shallow, being confined to the destruction of weeds and keeping the surface mellow. None were hilled up except where so stated. The vines were not disturbed in any manner.

TEST OF VARIETIES.

The test of varieties for 1884 included fifty named sorts, and for 1885 about one hundred named sorts, with also a large number of seedlings, mostly of our own origination. On these latter we are not yet able to report with any satisfaction. The list of named varieties includes a number not offered until last year, and some which are being introduced during the present spring.

Our best endeavors were put forth to give all varieties an impartial test, and this was accomplished as nearly as it is possible under conditions of field experimentation.

The yields are all given to perfect stand. The simple fact that a variety shows a yield a few bushels greater or less than another has no particular significance for or against it, but all of the points should be well weighed. The total yield and time of ripening for 1884 of such varieties as were tested that year are given. These cumulative results add materially to the value of the tests. The yields for the past year are much superior to any variety yields heretofore published by the Station. This is principally owing to the favorable character of the season. The planting was closer than usual, and doubtless added somewhat to the total yields, but so far as could be determined worked no injury to the crop, as regards size of tuber. The list of varieties is divided into three sections: Early, medium, and late sorts. This very much facilitates comparisons. Those ripening previous to August 1st are classed as "early;" from August 1st to 20th "medium;" and those afterwards as "late sorts."

TABLE EXHIBITING RESULTS OF EARLY SORTS.—(Ripened before August 1, 1885.)

No. of plot.	Variety.	Yield of market- able potatoes.	Yield of small potatoes.	Total yield.	Date of ripening.	Yield for 1884, total bushels.	Date of ripening, 1884.	Table quality.
2	Beauty of Hebron.....	287.0	62.4	349.4	July 25.....	155.0	July 23.....	9½
3	Belle.....	86.6	39.1	125.7	" 27.....	98.3	Aug. 11.....	7
6	Boston Market.....	239.4	90.8	330.2	" 27.....	158.8	" 8.....	9
10	Chas. Downing.....	319.4	55.7	375.1	" 25.....			10
11	Clark's No. 1.....	363.0	94.9	457.9	" 30.....	158.8	July 18.....	9
93	Early Durham.....	335.8	90.8	426.6	" 25.....			9
17	Early Gem.....	231.4	190.6	422.0	" 25.....			8
18	Early Harvest.....	336.9	52.2	389.1	" 25.....	162.1	July 18.....	9
19	Early Ohio.....	324.4	68.1	392.5	" 25.....	90.7	" 18.....	7
94	Early Pearl.....	326.7	93.0	378.9	" 25.....			8
21	Early Rose.....		104.4	431.1	" 27.....	113.4	Aug. 2.....	9
22	Early Sunrise.....	170.3	27.2	197.5	" 27.....			6
75	Early White Prize.....	294.5	97.6	392.1	" 31.....			7½
23	Electric.....	220.9	24.2	245.1	" 27.....	109.6	Aug. 2.....	7
25	Gardner's Early Seedling.....	270.0	137.3	407.3	" 25.....			8
35	Lee's Favorite.....	423.0	48.8	471.8	" 27.....	124.7	Aug. 2.....	8
37	Mayflower.....	199.7	149.7	349.4	" 31.....	90.8	" 2.....	8
74	New O. K.....	197.4	124.8	322.2	" 31.....			8½
40	Nott's Victor.....	296.1	30.6	326.7	" 30.....	151.2	Aug. 2.....	6
43	Pearl of Savoy.....	353.9	32.9	386.8	" 30.....	113.4	July 23.....	8
95	Prince Edward's Early Rose.....	274.5	82.3	356.8	" 25.....			8½
51	Rosy Morn.....	326.7	81.7	408.4	" 30.....			8
27	Seedling of Extra Early Vermont.....	121.4	77.1	198.5	" 28.....			7
55	Snowflake.....	217.8	95.3	313.1	" 31.....	151.2	Aug. 2.....	10
56	Snow Queen.....	214.4	62.4	276.8	" 30.....			7

58	St. Patrick.....	249.6	47.6	297.2	July 31.....	121.0	Aug. 15.....	5
59	Stray Beauty	330.1	20.4	350.5	" 20.....	.....	.....	5
60	Telephone	188.3	95.3	283.6	" 31.....	102.0	Aug. 2.....	8
89	Thorburn.....	335.0	47.5	382.5	" 27.....	.....	.....	8
61	Tremont	190.6	60.1	250.7	" 30.....	109.6	Aug. 8.....	6½
62	Vanguard	195.1	81.7	276.8	" 25.....	86.9	July 23.....	8
64	Vick's Extra.....	90.8	95.3	186.1	" 27.....	75.6	Aug. 2.....	8½
65	Vick's Improved Peach Blow	61.3	136.6	197.9	" 31.....	158.8	" 8.....	.....
68	Watson's Seedling	304.0	76.0	380.0	" 31.....	.....	.....	8

TABLE EXHIBITING RESULTS OF MEDIUM EARLY SORTS.—(Ripened August 1st to 20th, 1885.)

No. of plot.	Variety.	Yield of market- able potatoes.	Yield of small potatoes.	Total yield.	Date of ripening.	Yield for 1884. total bushels.	Date of ripening, 1884.	Table quality.
1	Alexander's Prolific.....	264.3	11.3	275.6	Aug. 16.....	.....	.....	6
4	Big B-neft	181.5	43.1	224.6	" 8.....	.....	.....	8
5	Bonanza.....	267.7	79.4	347.1	" 8.....	.....	.....	6
7	Burbank	227.5	43.6	271.1	" 8.....	151.2	Aug. 11.....	8
8	Cap Sheaf	310.8	1.1	311.9	" 8.....	.....	.....	7
9	Champion of America.....	263.2	19.3	282.5	" 8.....	143.7	Aug. 2.....	6
14	Cook's Superb	277.4	52.6	330.0	" 13.....	158.8	" 11.....	5
78	Cullom's Superb.....	360.7	5.7	366.4	" 16.....	.....	.....	7
16	Dunmore's Seedling.....	323.3	39.7	363.0	" 4.....	136.1	Aug. 2.....	8
33	Late Ohio	338.8	26.6	365.4	" 8.....	155.1	" 8.....	9
85	Matchless	146.3	86.2	232.5	" 17.....	.....	.....	5
41	O. K. Mammoth Prolific.....	335.8	34.0	369.8	" 8.....	151.2	Aug. 18.....	7
42	Parson's Prolific	298.3	81.7	380.0	" 13.....	151.2	" 18.....	5
36	Peck	221.4	38.1	259.5	" 8.....	.....	.....	6
47	Pride of the West.....	349.4	51.1	400.5	" 13.....	.....	.....	6
87	Queen of Rosea	257.9	42.6	300.5	" 8.....	.....	.....	8
48	Queen of the Valley.....	279.1	36.3	315.4	" 8.....	158.8	Aug. 18.....	8
49	Red Elephant	254.1	54.5	308.6	" 8.....	128.6	" 27.....	5
50	Rochester Favorite.....	129.3	86.2	215.5	" 13.....	136.1	" 27.....	4
53	Salt Lake Queen.....	285.9	31.8	317.7	" 8.....	.....	.....	7
57	Spaulding's Seedling.....	170.2	79.4	249.6	" 13.....	.....	.....	6
63	Vermont Champion.....	229.1	61.3	290.4	" 8.....	151.2	Aug. 8.....	6
66	Vick's Prize	281.3	68.1	349.4	" 8.....	139.9	" 18.....	6
67	Wall's Orange	93.0	47.6	140.6	" 8.....	151.2	" 27.....	5
91	Weld's No. 1	275.9	26.6	302.5	" 13.....	.....	.....	7
92	Weld's No. 22	340.3	7.6	347.9	" 13.....	.....	.....	6
72	White Elephant	190.6	63.5	254.1	" 17.....	113.4	Aug. 27.....	7
73	White Star	124.8	68.1	192.9	" 13.....	121.0	" 27.....	8

TABLE EXHIBITING RESULTS OF LATE SORTS. (Ripened after August 20th, 1885.)

Plot No.	Variety.	Yield of merchantable potatoes.	Yield of small potatoes.	Total yield.	Date of ripening.	Yield for 1884. Total bushels.	Date of ripening, 1884.	Table quality.
16	Blue Victor.....	155.0	33 5	188.5	Aug. 27.....	.....	.....	4
12	Colvin's Excelsior.....	183.9	7 3	191.2	" 21.....	.....	.....	5
15	Dakota Red.....	158.4	76.8	235.2	" 27.....	158.8	Aug. 16.....	6
79	Dictator.....	313 1	81.7	394 8	" 27.....	.....	.....	7
24	Empire State.....	322.2	86.2	408.4	" 27.....	.....	.....	8
80	Farina.....	106 6	95.3	201.9	" 27.....	.....	.....	7
26	Garfield.....	168.2	130.7	298.9	" 21.....	102.1	Aug. 24.....	7
81	Great Eastern.....	234.7	84.7	319 4	" 23.....	.....	.....	5
28	Hall's Early Peachblow.....	131.6	45.4	177.0	" 27.....	83.2	Aug. 11.....	8
82	Home Comfort.....	174.7	68.1	242.8	" 27.....	.....	.....	6
29	Iroquois.....	121.4	77.1	198.5	" 21.....	68 0	Aug. 8.....	6
30	James Vick.....	406.1	43.1	449.2	" 27.....	158.8	" 8.....	6
31	Jones' Prize Taker.....	221.2	23.8	245.0	" 21.....	102.1	" 11.....	8
32	Jumbo.....	317.6	133.9	451.5	" 24.....	185.3	.....	5
83	Knapp's Snowbank.....	344 9	53.3	398.2	" 27.....	.....	.....	7
34	La Plume Triumph.....	281.3	80 5	361.8	" 27.....	166.4	Aug. 21.....	6
36	Mammoth Pearl.....	292.7	39.7	332.4	" 21.....	151.2	" 11.....	6
38	Marvel of Beauty.....	270.0	31.8	301.8	" 21.....	.....	.....	6
39	Montreal.....	72.6	105.5	178.1	Sep. 24.....	.....	.....	6
44	Perfect Gem.....	377.8	27.2	405.0	Aug. 21.....	.....	.....	6
45	President Lincoln.....	294.9	61 3	356.2	Sep. 10.....	.....	.....	7
46	Pride of Lisbon.....	310.8	74.9	385 7	Aug. 27.....	.....	.....	6
96	Red Star.....	349.4	18.2	367 6	" 28.....	.....	.....	7
52	Rural Blush.....	325.6	23.8	349.4	" 27.....	.....	.....	8
54	Snow Fairy.....	194.5	76.5	271.0	" 27.....	211.7	Aug. 27.....	7
88	Stanton.....	246.8	14.5	261.3	" 21.....	.....	.....	7
134	State of Maine.....	249.6	43.1	292.7	" 28.....	.....	.....	7
90	Weld's Jumbo.....	342.8	64.5	407.3	" 28.....	147.5	Aug. 15.....	8
69	Weld's No. 14.....	217.8	47.6	265.4	" 27.....	.....	.....	4
71	White Chief.....	258.6	86 2	344.8	Sep. 5.....	.....	.....	4

The dates of ripening for the two years vary considerably in some instances, but, in the main, are more uniform than we had supposed would be the case. Those showing the greatest variation are, as a rule, the least well established varieties. The planting for 1884 was on May 3d; for 1885, on May 4th. The yields bear little enough resemblances to each other, but this is altogether a matter of attendant conditions, and in this case is fully explained in the reports for the two years. There is not in all cases a correspondence of the larger yields of the two years, yet in a majority of cases there is.

Of the early varieties, three reach above 350 bushels per acre of merchantable potatoes, viz: Clark's No. 1, Lee's Favorite, and Pearl of Savoy. Lee's Favorite shows greatest total yield, and Clark's No. 1 second best. A large number of varieties in the above list show good yields, and, on the whole, this table presents an admirable collection of early potatoes.

Of the second early, or medium sorts, Cullom's Superb, Pride of the West, and Weld's No. 22 show the best yields of marketable potatoes. The extremely low yield of small potatoes of the first and last named is remarkable. Pride of the West shows the best total yield. These three are all new varieties, but little can be said for their table qualities. The quality of all the varieties grown will be fully mentioned in another place.

Of the late sorts, James Vick, Perfect Gem, and Red Star head the list for marketable yield, and Jumbo for total yield, with James Vick second.

There are 34 of the early sorts and their average yield is 293.2 bushels; 28 of the medium sorts average yield 298.4 bushels; 30 of the late sorts with an average yield of 309.9 bushels. Lee's Favorite shows the largest total yield of all varieties, and Stray Beauty was the first to ripen. The column showing table qualities is arranged on a scale of points from 0 to 10. These were all tested on the table this season, and the results are quite fully given under "Notes on Varieties."

The testing of quality was done during December and January, after the varieties had been put into winter quarters. Chas. Downing and Snowflake head the list and are the only ones graded 10. They are about equally early; the former, apparently, is more productive than the latter. This is the first test made of the Chas. Downing, and it has not been in the market until this spring (1886). Of the others, Beauty of Hebron stands highest, $9\frac{1}{2}$, and five reach 9, 14 are graded 8 (three of them $8\frac{1}{2}$). In all, 22 of the early varieties are graded 8 and upwards.

Of the medium varieties, one only reaches 9 in grade of table qualities. This is Late Ohio. Six are graded 8; in all, seven are graded 8 and upwards.

Of the late varieties, Rural Blush is graded $8\frac{1}{2}$; six, in all, reaching 8.

About 65 per cent. of the early sorts are graded 8 and upwards, 25 per cent. of the medium sorts, and 20 per cent. of the late sorts. Whether this would hold good for successive years we are unable to say, but the grading for table qualities the present year compares very closely with grading of last year, and we shall endeavor to ascertain in the future whether earliness has not a sensible effect upon quality. If so, it is very important for some of the early sorts, as is well known, are good keepers and are used as late in the spring as the later ripening sorts. It may be argued that some of the later sorts would show a better grade if tested later in the season, but we would suggest that if a potato is not fit for table use during the months of this trial, its practical value is lessened. It should be distinctly understood that judgment is not pronounced, either for or against a variety, upon one trial. The aim is to make the test thorough and perfectly impartial, and, if after being repeated for two or three years, a variety continues to fall below a reasonable standard, it is discarded. The soil here is certainly not the most favorable for producing good table qualities, but the comparison is thought to be fair.

Where table quality is marked below 7 it is quite poor.

NOTES ON VARIETIES.

1. Alexander's Prolific. (O. H. Alexander.) Stout, erect growth of vine, about 20 inches high, leaves medium size, slightly curled; tubers were very fine, resembling large Snowflakes somewhat, light russet, eyes not very deep, close in hill, above medium. Tested for table, skin did not break in boiling; flesh solid and white; little wet; grain and flavor not excellent; graded 6.

2. Beauty of Hebron. (I. E. Jones, 84.) Stout growth of vines, slightly decumbent, 18 inches high, leaves medium size and smooth; tubers fair, resembling Early Rose, light rose colored, smooth, shallow eyes, close in hill, medium size. Tested for the table, skin burst nicely; flesh white and firm; grain and flavor very good; graded 9½.

3. Belle. (Station.) Growth uneven, slightly decumbent, 13 inches high, light green, leaves curled and small; tubers poor, roundish and flattened, close in hill, small and scabbed, light purplish color. Tested for the table, did not break open; solid and white; grain and flavor fair; graded 7.

4. Big Benefit. (J. C. Everett.) Fairly strong growth of vine, 18 inches high, slightly decumbent, light green, leaves smooth, medium size; tubers very fair, smooth, few eyes, close in hill, light purple color. In Cooking skin did not break; solid, white; flavor and grain very fair; graded 8.

5. Bonanza. (Frank Ford & Son.) Strong, erect growth, 21 inches tall, green, smooth leaves, of medium size; tubers fair, roundish, light purplish color, close in hill, smooth, above medium size. Cooking test; skin broke a little; solid, white; grain fair; flavor flat and watery; graded 6.

6. Boston Market. (Ford & Son, 84.) Strong growth, decumbent, 20 inches high, foliage green, smooth and medium size; tubers very fair, light purple tint, close in hill, above medium. Cooking test; skin broke well in boiling; flesh solid, dark, dry; grain fine; flavor good; graded 9.

7. Burbank. (Station.) Strong, erect growth, 18 inches high, foliage light green; tubers very fair, long and flattened, smooth, light color, medium size, close in hill. Cooking test; skin did not break; flesh solid and white; grain fine, and flavor good. Not so dry as Burbanks usually are; graded 8.

8. Cap Sheaf. (J. C. Everett.) Strong growth, slightly decumbent, 20 inches high, leaves green, smooth and large; tubers very fair, very much resemble Burbanks, close in hill, medium size. Cooking test; skin did not break; solid, white; little wet, otherwise very fair; graded 7.

9. Champion of America. (Henderson, 84.) Strong, erect growth, 20 inches high, light green, leaves medium; tubers very fine, long and round, smooth, light rose tint, large size, close in hill. Cooking test; skin broke a little; flesh solid and white; grain only fair; flavor flat and watery; graded 6.

10. Chas. Downing. (Alexander.) Strong, nearly erect, growth 22 inches high, foliage green, smooth and medium size; tubers very good, of roundish form, medium size, little scattered in hill, smooth, light color. Cooking test; skin broke well in boiling; firm white flesh; flavor and grain excellent; graded 10. We consider this *one* of the new varieties worthy of commendation.

11. Clark's No. 1. (Jones, 84.) Strong growth, slightly decumbent, 22 inches high, foliage green, slightly curled, medium size; tubers very fair, resemble Rose, are little lighter in color, close in hill, smooth, medium size. Cooking test; skin broke a little; solid, dark colored flesh; grain excellent; flavor fair; graded 8.

12. Colvin's Excelsior. (Geo. H. Colvin.) Strong, nearly erect, 20 inches high, foliage pale, and medium size; tubers good, roundish in form with rather deep eyes, reddish brown color, close in hill, above medium. Cooking test; solid and white flesh, wet and poor; graded 5.

14. Cook's Superb. (Jones, 84.) Strong, decumbent, 22 inches high, foliage light green, medium size; tubers very fair, long, smooth, light, russet skin, close in hill, a few are scabbed, above medium size. Cooking test; very poor, wet things; graded 5.

15. Dakota Red. (Livingston, 84.) Fair growth, decumbent, 18 inches high, foliage green, curled, medium size; tubers poor, ill-shaped and small, close in hill, reddish brown cast. Cooking test; very poor wet things; graded 5. This variety has deteriorated very much in appearance during the past two years, and is practically worthless here.

16. Dunmore's Seedling. (Jones, 84.) Strong growth, 20 inches high, light green, leaves curled, medium size; tubers fair, round and flattened, resemble Mammoth Pearl, except skin is not russet enough, close in hill, light color, some scabbed, medium size. Cooking test; skin broke fairly well; flesh firm and white; flavor and grain good; graded 8.

17. Early Gem. (Livingston, 84.) Growth strong, decumbent, 20 inches high, foliage green, smooth; tubers fair, rather small, close in hill and near to surface, smooth, longish, light with pinkish cast. Cooking test; broke fairly well; flesh firm, rather dark; flavor and grain very fair; graded 9.

18. Early Harvest, (Geo. W. Campbell, 84.) Growth strong, decumbent, 20 inches high, foliage light green, leaves smooth; tubers very fine, longish, smooth, rose brown, close in hill and near to surface, medium size. Cooking test; broke little, fairly dry; flesh firm, little dark; grain fair, little waxy; flavor little strong; graded 7.

19. Early Ohio. (Station.) Strong, erect, 20 inches high, foliage green and smooth; tubers fair, little longer than thick, smooth, few scabby, rose brown, close in hill, fair size. Cooking test; broke a little; flesh firm, dark colored; grain and flavor good; graded 8. Not up to standard of this variety.

21. Early Rose. (Station.) Fair growth, 18 inches high, decumbent, foliage light green; tubers fair, longish, rose, or reddish brown color, close in hill, smooth, medium. Cooking test, burst fairly well; firm, little dark; grain and flavor excellent; graded 8.

22. Early White Prize. (Colvin.) Strong, erect, 20 inches high, foliage light green; tubers longish, smooth, eyes quite deep, light color, close in hill, above medium. Cooking test; did not break in boiling; flesh solid, white, fairly dry; grain and flavor fair; graded 7½.

23. Electric. (Ford & Son, 84.) Medium growth, erect, 18 inches high, foliage green, curled; tubers fair, long, purple and brown, some rough, close in hill, fair size. Cooking test; broke a little; solid, yellow flesh; grain and flavor fair; graded 7.

24. Empire State. (Burpee.) Strong, erect, 22 inches high; tubers large, white, smooth, close in hill. Cooking test; did not break; solid, dark color; grain and flavor only fair; graded 7.

25. Gardner's Early Seedling. Growth strong, erect, 20 inches high; foliage light green and smooth; tubers long, smooth, light with rose tint, close in hill and near to surface. Cooking test; broke little in boiling; flesh firm, white; grain and flavor excellent; graded 8½.

26. Garfield. (Ford & Son, 84.) Growth fair, decumbent, 18 inches high; foliage green, curled, rather small; tuber resembles Snowflakes, rather small, close to surface. Cooking test; did not break in boiling; solid, white; grain and flavor fair, little waxy; graded 7.

27. Seedling of Extra Early Vermont. (————) Growth only fair; decumbent, 16 inches high; foliage light green; tubers long, smooth, blue slatish color, close in hill, rather small. Cooking test; did not break; solid, rather dark flesh, little wet and waxy; graded 7.

28. Hall's Early Peach Blow. (Gregory, 84.) Growth only fair; 14 inches high; foliage light green, curled; tubers roundish and long, smooth, light and brownish, with pink in the eyes, close in hill, fair size. Cooking test; did not break, solid, nearly white; grain fine; flavor quite good; graded 8.

29. Iroquois. (Bliss, 84.) Growth fair, decumbent, 18 inches high; foliage green, curled, small; tubers white, small, close in hill and to surface. Cooking test, wet and poor; graded 6.

30. Jas. Vick. (Ford & Son, 84.) Strong, erect, 20 inches high; foliage green and smooth; tubers very fine, except some ill-shapen, longish, light and russet, close in hill and near to surface, above medium. Cooking test; did not burst, solid, dark and watery; strong odor; flavor flat; graded 6.

31. Jones' Prize Taker. (J. A. Everett, 84.) Medium growth, decumbent, 18 inches high; foliage light green; tubers very much resemble 30, only are smaller, close in hill, smooth medium. Cooking test; did not break; solid, white, fair grain, and good flavor; graded 8.

32. Jumbo. (Henderson.) Strong, decumbent, 20 inches; foliage light green, curled; tubers roundish flattened after Mammoth Pearl type, light, russet, very close in hill, some very fine. Cooking test; broke just a little; fair grain and flavor; graded 8.

33. Late Ohio. (Station.) Strong, erect, 22 inches; foliage green, curled; tubers resemble very much the Early Ohio, rose brown color. Cooking test; broke some; solid, fairly white and dry; fine grain and good flavor; graded, 9.

34. La Plume Triumph. (I. F. Tillinghast) Strong, nearly erect, 22 inches; foliage, light green, curled; tubers smooth, rather long, medium size, close in hill, rose brown color. Cooking test; broke little, solid, rather dark, coarse, flavor poor; graded 7.

35. Lee's Favorite. (Frank Ford & Son, 84.) Strong, decumbent, 20 inches tall; foliage green and smooth; tubers Burbank shape, but eyes and color are different, smooth, light rose tint, rather scattering in hill, medium size. Cooking test; broke very well, not all solid at center; grain fine; flavor not extra; graded 9.

36. Mammoth Pearl. (Station.) Strong growth, 28 inches high, decumbent; tubers roundish flattened, light russet, fairly deep set eyes, close in hill and near to surface. Cooking test; did not break, solid and white; grain coarse; flavor not good, watery; graded 6.

37. May Flower. (Henderson, 84.) Strong, decumbent, 22 inches; foliage light green; tubers roundish small, somewhat after Snowflake type, light, russet, close in hill and to surface. Cooking test; broke little, solid, white; grain and flavor fairly good; graded 8.

39. Montreal. (Alexander.) Very strong growth, 28 inches high; dark green foliage. Grew until frost killed it, and was an utter failure, bearing but a few small tubers.

40. Nott's Victor. (R. Nott, 84.) Fair, nearly erect, 18 inches; foliage light green; tubers roundish, light with pink tint, smooth, few eyes, close in hill and to surface, medium size. Cooking test; did not break, solid, white; grain and flavor poor, waxy; graded 6.

1. O. K. Mammoth Prolific. (Livingstons.) Strong, decumbent, 24 inches; foliage green, smooth; tubers, light colored russet, medium size, close

in hill. Cooking test; did not break, solid, white, wet, coarse and hard; graded 5.

42. Parson's Prolific. (Ford & Son, 84.) Strong, 22 inches; foliage dark green; tubers roundish flattened, light and russet, resemble Mammoth Pearl, close in hill, medium size. Cooking test; poor, wet things; graded 5.

43. Pearl of Savoy. (Breck & Son, 84.) Strong growth, 19 inches; foliage green and smooth; tubers longish, fair and smooth, light rose tint, close in hill and to surface, above medium. Cooking test, broke little, dark, solid; grain fine, and flavor good; graded 8.

44. Perfect Gem. (J. C. Everitt.) Strong, nearly erect, 20 inches; tubers roundish and flattened, light and russet, close in hill, fair size. Cooking test; did not break, solid, white, coarse and wet; graded 6.

45. President Lincoln. (———) Strong, erect, 20 inches; foliage dense, light green; tubers, roundish, uneven eyes rather deep, red brown color, close in hill, one half scabby, medium size. Cooking test; did not break, solid, white; grain and flavor only fair; graded 7.

46. Pride of Lisbon. (Ford & Son.) Strong, erect, 26 inches; tubers resemble Mammoth Pearl, only fair size, many rough and scabby, eyes rather deep. Cooking test; poor and watery; graded 6.

47. Pride of the West. (Ford & Son.) Strong, 22 inches high; foliage light green; tubers resemble previous somewhat, and are also scabby. Table qualities poor; graded 6.

48. Queen of the Valley. (Ford & Son, 84.) Growth fair, erect, 22 inches high; foliage light green; tubers long and flatish, above medium, light rose tint, close in hill. Cooking test; broke little, solid, little dark; grain and flavor fairly good; graded 8.

49. Red Elephant. (Ford & Son, 84.) Strong growth, erect, 22 inches; foliage dark green; tubers longish, rough, above medium, reddish brown, scattering in hill. Table qualities very poor, 5.

50. Rochester Favorite. (Ford & Son, 84.) Strong, erect, 22 inches high; tubers longish and round, light, smooth, small, and scattering in hill. Table qualities very low, 4.

51. Rosy Morn. (Ford & Son.) Strong, 22 inches high; tubers above medium, light reddish color, smooth, close in hill and to surface. Table qualities fairly good; graded 8.

52. Rural Blush. (Jones, 84.) Strong, erect, 22 inches; foliage light green, curled; tubers, longish, smooth, above medium, light with a pink tint, scattering and close to surface. Cooking test; broke a little; grain and flavor very fair; graded 8½.

53. Salt Lake Queen. (Ford & Son.) Strong nearly erect, 22 inches; foliage light green; tubers ill shapen, light, close in hill, above medium. Cooking test; broke little; grain coarse; flavor fair; graded 7.

54. Snow Fairy. (Alexander.) Strong, erect, 20 inches; foliage light green; tubers roundish, flattened, resemble Mammoth Pearl, light, russet, rather close in hill, scabby, above medium. Cooking test; solid, white, fair grain; flavor poor; graded 7.

55. Snowflakes. (Station.) Strong, decumbent, 20 inches high; foliage light green; tubers longish, flattened, white, russet, good medium, close in hill; cooking test; burst nicely, firm white flesh, grain fine, flavor excellent; graded 10.

56. Snow Queen. (Alexander.) Strong, erect, 20 inches high; foliage light green; tubers, roundish flattened, few eyes, light colored, above medium; cooking test; did not break, solid, white flesh, grain and flavor only fair; graded 7.

57. Spaulding's Seedling. (Ford & Son.) Strong, erect, 20 inches high;

foliage light green, curled; tubers roundish flattened, light and russet, borne in clusters, medium size; cooking test, did not break, poor, wet and waxy; graded 6

58. St. Patrick. (Ford & Son, 84.) Strong, slightly decumbent, 22 inches high; tubers longish, smooth white, resemble Burbanks, close in hill, above medium; cooking test; did not break, solid white, watery and flat; graded 5.

59. Stray Beauty. (Samuel Wilson.) Fair growth, nearly erect, 18 inches; tubers round, deep eyes, reddish brown color, close in hill, above medium; cooking test; did not break, solid, dark, watery, bad flavor; graded 5.

60. Telephone. (Henderson, 84.) Medium growth, nearly erect, 17 inches high; foliage light green; tubers considerably resemble Snowflake, scattering in hill, close to surface, hardly medium; cooking test, broke well; flesh firm, not very white; fine grain and good flavor; graded 8.

61. Tremont. (Bliss, 84.) Strong, erect, 21 inches high; foliage dark green; tubers resemble Burbanks, but not so smooth, close in hill, medium; cooking test, quite poor; graded 6½.

62. Vanguard. (Henderson, 84.) Medium, erect, 16 inches high; tubers longish, medium size, close in hill, resemble Rose; cooking test; broke fairly well, solid, little, dark; grain good, flavor fairly good; graded 8.

63. Vermont Champion. (Henderson, 84.) Strong, slightly decumbent, 20 inches high; foliage dark green; tubers light color, russet, very scabby, resemble Mammoth Pearl, close in hill and to surface, medium; cooking test; did not break, poor, wet affair; graded 6.

64. Vick's Extra. (Vick, 84.) Medium growth, erect, 15 inches high; tubers inferior, after Snowflake type, smooth, close in hill, small; cooking test; did not break, solid white; grain and flavor good; graded 8½.

65. Vick's Improved Peach Blow. (Vick, 84.) Medium growth, decumbent, 16 inches high; tubers poor, inferior things, small and ill shapen; table qualities not tested.

66. Vick's Prize. (Vick, 84.) Strong, decumbent, 22 inches high, smooth, large size; light and russet, close in hill; cooking test; poor; graded 6.

67. Wall's Orange. (Ford & Son, 84.) Medium growth, decumbent, 16 inches high; tubers poor, purplish brown cast, small; table qualities very poor; graded 5.

68. Watson's Seedling. (Wilson.) Strong, nearly erect, 20 inches high; foliage light green; tubers Rose type, smooth, medium size; cooking test, broke little, solid, dark; grain fine, flavor fair; graded 8.

69. Weldts No. 14. (Ford & Son) Strong, erect, 20 inches high; foliage small and curled; tubers ill-shapen, rough, round and flattened, rose color, close in hill, above medium; cooking test; very poor things; graded 4.

70. Weldt's No. 22. (Ford & Son.) Strong, erect, 20 inches high; tubers large and fine, light purple, smooth, close in hill; cooking test, did not break, solid, very white, wet and flat; graded 7. This would be a grand potato if only dry and of better flavor.

71. White Chief. (Ford & Son.) Strong, decumbent, 21 inches high; tubers very similar to Mammoth Pearl, rough and scabby; table qualities very poor; graded 4.

72. White Elephant. (Station.) Fairly strong, decumbent, 18 inches high; tubers resemble Burbanks, and are often sold for them in market; cooking test; did not break, dark and solid, little wet and coarse; flavor fair; graded 7½.

73. White Star. (Livingston, 84.) Strong, erect, 22 inches high; foliage light green; tubers resembles Burbanks, smooth, medium size; cooking test; broke a little, solid, white; grain and flavor good; graded 8.

74. New O. K. (Livingston, 84.) Strong, decumbent, 20 inches high; foliage light green; tubers longish flattened, above medium, light and pale rose tint; cooking test; did not break; grain and flavor quite good; graded 8½.

75. Early Sunrise. (Livingston, 84.) Medium growth, decumbent, 16 inches high; foliage light green; tubers rather long brownish red, small eyes, close in hill, smooth, medium; cooking test; did not break, solid, white; grain little coarse, flavor flat, watery; graded 6.

76. Blue Victor. (L. C. Alwood.) Strong, erect, 21 inches high; foliage dark green and rather scanty; tubers round and uneven, eyes rather deep, light and strongly banded with purple, scattering, scabby, above medium; cooking test; very poor things; graded 4.

78. Cullom's Superb. (W. E. Weld.) Strong, erect, 22 inches high; foliage green and large; tubers very fine, long, light and russet, scattering in hill, above medium; table qualities rather poor; graded 7.

79. Dictator. (Thorburn & Co.) Strong, erect, 22 inches high; tubers resemble Mammoth Pearl in shape and appearance, smooth, close in hill, above medium; table qualities poor; graded 6.

80. Farina. (Weld.) Strong, erect, growth 20 inches high; foliage light green; tubers long and smooth, white, close to surface and straggling, barely medium; cooking test; broke a little in boiling, solid, white; grain fine and flavor good; graded 8. These are so long that their shape is objectionable.

81. Great Eastern. (Thorburn & Co.) Medium growth, decumbent, 18 inches high; foliage light green; tubers resembles Mammoth Pearl, close in hill, scabby, medium size; cooking test; did not break, flavor strong, is waxy and flat; graded 5.

82. Home Comfort. (Weld.) Strong, erect, 20 inches high; foliage curled; tubers long, flattened, smooth, light rose tint, scattered in hill, medium size; table qualities, poor; graded 6.

83. Knapp's Snowbank. (Weld.) Strong, erect, 22 inches high; foliage light green, wrinkled; tubers resemble Snowflakes, more round and larger, close in hill, some scabby, above medium; cooking test, poor things; graded 5.

85. Matchless. (Weld.) Strong, decumbent, 20 inches high; foliage slightly curled; tubers rather small, somewhat on Snowflake type, close in hill, russet; table qualities poor; graded 5.

86. Peck. (Weld.) Strong, decumbent, 20 inches high; tubers good size, light, with pink coloring, small eyes, close in hill; table qualities poor.

87. Queen of Roses. (Weld.) Strong, decumbent, 20 inches high; tubers above medium size, between brown and light red, close in hill. Cooking test; broke a little, solid, dark, grain fair, flavor good, 8.

88. Stanton. (Weld.) Strong, erect, 20 inches high; foliage light green; tubers roundish in form, shallow eyes, brownish red, close in hill, smooth, good size. Cooking test; did not break, solid, very white, grain good, flavor flat, watery, 7.

89. Thorburn. (Thorburn & Co.) Medium, erect, growth 18 inches high; tubers fine, large, white with slight purple tint, close in hill. Cooking test; burst open a little, solid, white, grain good, flavor fair, graded 8.

90. Weld's Jumbo. (Weld.) Strong, erect, 24 inches high; tubers large and fine, smooth, close in hill, light color. Cooking test; did not break, solid, white, good grain and flavor, graded 8.

91. Weld's No. 1. (Weld.) Strong, erect, 22 inches high; foliage light green, small and curled; tubers large, light with pinkish color on portions, shallow eyes, smooth, scattering in hill. Cooking test; burst little, solid, white, little wet and waxy, flavor low, graded 7.

92. Weld's No. 22. (Weld.) Strong, erect, 22 inches high; tubers much

resemble previous, very fine appearing. Cooking test; burst a little, solid, very white, grain good, watery, 6½.

93. Early Durham. (C. E. Allen.) Strong, erect, 20 inches high; foliage light green; tubers fair size, some misshapen, light rose color, scattering in hill. Cooking test; broke a little, solid, white, little waxy, flavor fine, graded 8.

94. Early Pearl. (J. A. Everett.) Strong, slightly decumbent, 20 inches high; tubers longish, smooth, rose brown color, scattering in hill, above medium. Cooking test; burst open well, solid, little dark, grain and flavor quite good, graded 8½.

95. Prince Edwards Early Rose. (J. A. Everett.) Strong, decumbent, 20 inches high; tubers fair, medium size, rose tint, smooth, close in hill and to surface. Cooking test; burst open fairly well, solid, white, grain and flavor good, 8½.

96. Red Star. (J. H. Everett.) Strong, erect, 22 inches high; tubers large and fine, pink, smooth, scattering in hill. Cooking test; burst a little, solid, white, waxy, flavor fine, graded 7.

134. State of Maine. (Burpee.) Strong, erect, 20 inches high; foliage light green; tubers somewhat resemble Mammoth Pearl, close in hill, above medium. Cooking test; did not burst, solid, white, coarse and wet, graded 7.

136. O. K. Mammoth Prolific. (Livingston.) Strong, erect, 20 inches high; foliage small and curled; tubers resemble previous, medium size. Cooking test, burst little, solid, white, grain and flavor good, graded 8.

SEEDLING VARIETIES.

From the large number of seedlings grown in 1884 some thirty were selected as the most promising, and grown the past year. The growth of vines was quite remarkable with some of these, but the yields were in all cases small and no full report will be given this year. In most cases they ripened late. Many of them produced a few fine tubers. Some tubers and seed of two species of wild potatoes, discovered by Mr. J. G. Lemmon, of Oakland, Cal., growing high up the Sierra Nevadas, were planted, but in our rich soil they failed to produce tubers, except in one instance, where three very small ones formed. The vines grew vigorously and were quite a novelty. We had hoped that they might, by constant culture, be improved, either through the seed or tuber, but now think the conditions here so unnatural as to make this impossible. They bloomed profusely for weeks but bore no seed.

METHODS OF CULTURE.

The subject of depths of planting is first presented under this head, or rather ridge and flat culture and different depths. These were planted adjacent to the variety plots and in a similar manner, and were fertilized the same. The surface or ridge culture is the old style of planting on the surface, giving deep culture and hilling up; the furrow planting is four inches deep, except where otherwise stated, and received shallow culture.

The variety used was Mammoth Pearl, cut two eyes to the piece. All ripened quite evenly.

How planted.	Yield of large tubers.	Yield of small tubers.	Total yield.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Surface planting.....	217.8	44.8	262.6
Furrow ".....	263.2	15.9	279.1
Surface ".....	215.2	57.6	272.8
Furrow ".....	299.7	35.2	334.9
" " 6 inches.....	285.8	34.0	329.0
" " 8 inches.....	226.8	20.4	247.2
" " 10 inches.....	183.7	27.2	210.9
" " 12 inches.....	150.7	24.9	175.6

The work similar to this for 1884 showed no results upon which an argument could be based, but the above table presents some points worthy of consideration. The season of 1884 being so out of the normal conditions usually prevailing, may, in some measure, and doubtless does account for the differences in results. The first three plots of the above table do not vary materially in total yield, but show a quite marked variation in yield of large potatoes; the advantage being decidedly with furrow planting. It is also worthy of mention that the per cent. in number of large potatoes to small was very much better in furrow planting. Plot four also belongs with the three just mentioned, but it shows such a decided gain in total yield, as well as large tubers, that the comparison is better between the first three. Comparing the entire table, the maximum of large tubers and of total yield is reached at plot four, and from this the yields decrease quite evenly to the greatest depth. The tubers in all plots above four inches deep were found at a depth two to three inches less than that of planting. None of the other plots reach in yield of small tubers the two plots of surface planting.

CUTTING OF SEED.

Considerable work was done to study the effect of cutting the tuber, and, also, what part of the tuber, if any, shows the greatest vigor. To this end choice seed of standard varieties was procured from different sources, and was variously treated to study the results. First is presented a table of general work in cutting, in which but one variety is used, Burbanks.

The eighteen plots here given is a continuation of work which has now been in progress for three years, and the general averages given below the table emphasize the previous results. The maximum of total yield is at plot one, and of large tubers, at plot nine, both planted with large, whole seed. The general averages also give whole seed a decided preference, both as to total yield and large tubers; but the extremely large yield of small tubers is against them.

The time of ripening for ordinary and one-eye cutting was August 17th to 21st; whole seed ripened five to seven days earlier.

Plot.	Seed.	Yield of large tubers.	Yield of small tubers.	Total Yield.
		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
1	Large, whole seed.....	258.6	149.7	408.3
2	Small, ".....	193.6	72.6	266.2
3	Large, cut once lengthwise.....	231.4	106.6	338.0
4	Small, ".....	154.6	46.8	201.4
5	Large, cut crosswise (stem end).....	243.6	74.9	318.5
6	" " (seed end).....	254.1	86.2	340.3
7	Cut, ordinary.....	249.6	31.8	281.4
8	Cut, one eye.....	78.2	5.6	83.8
9	Large, whole seed.....	263.2	72.6	335.8
10	Cut, one eye.....	134.8	13.0	147.8
11	Large, whole seed.....	199.7	104.4	304.1
12	Cut, one eye reversed.....	173.1	11.2	184.3
13	Large, whole seed.....	217.8	106.6	324.4
14	Cut, one eye reversed.....	193.6	14.5	208.1
15	Large, whole seed.....	258.9	99.2	358.1
16	Cut, ordinary.....	160.8	38.9	199.7
17	Cut, on eye.....	122.5	7.9	130.4
18	Cut, one eye reversed.....	158.8	9.1	167.9
	Average of whole seed.....	239.6	106.5	346.1
	Average of ordinary cuts.....	205.2	35.3	240.5
	Average of one eye cuts.....	111.8	8.8	120.6
	Average of one eye reversed cuts.....	175.1	11.6	186.7

The terms "ordinary," "one eye," and "one eye reversed," have been explained fully in previous reports, but we add here that the first means two eyes to the piece, the second is cut slanting toward butt and to center, for the third reverse the tuber, cut off seed end and then cut to center as for previous.

It has been argued frequently in public print that the one eye system of cutting was superior to other methods for several reasons, among which are saving of seed, increased percentage of large tubers, etc., etc. We have always admitted without dispute both of these propositions but have maintained that this system of cutting was not practical, and should not be recommended for ordinary culture for the simple reason that such small cuttings to a greater or less extent impaired the vitality of the plant. Under perfect conditions of climate and cultivation there is no question, but that extraordinary results may be accomplished with this method of cutting, and so it might with some other method.

These small cuts should be planted closer than large ones, must not be covered to deep, and in a drouth are almost sure to fail where whole seed or large cuttings will produce a fair crop. The supposition has been advanced that on account of the internal structure of the tuber, this method of cutting one eye to the center, slanting the knife toward the stem end, was advantageous in this, that it maintained intact a supposed branch of which the "eye" is the terminal bud. The appearance of the internal structure of the potato gives ground for such a conclusion, but on well authenticated facts this supposition can not be maintained. For we have repeatedly turned the potato, and cut across the supposed internal branch immediately beneath the bud, and secured as good results from such cutting as from pieces cut so as to maintain intact the supposed internal branch.

Thus, in the above table reversed cutting shows a remarkably better yield than the most approved "one eye cutting." This we cannot explain, but consider it one of the freaks of plot experimentation. However, both results when

compared with ordinary and whole cuts teach the same general truth. The following table presents other work bearing on the same question :

	Yield of large tubers.	Yield of small tubers.	Total yield.
Beauty of Hebron—one eye	238.3	65.8	304.1
“ “ ordinary	285.9	59.0	344.9
Rural Blush—one eye	208.7	29.5	238.2
“ “ ordinary	274.5	25.0	299.5
O. K. Mammoth Prolific—one eye	222.6	24.2	246.8
“ “ “ ordinary	254.1	81.7	335.8
Early Ohio—one eye	163.4	43.1	206.5
“ “ ordinary	247.3	34.0	281.3
Burbank—one eye	176.7	26.6	203.3
“ “ ordinary	272.3	34.0	306.3
Mammoth Pearl—one eye	215.5	36.3	251.8
“ “ ordinary	290.4	47.2	337.6
White Elephant—one eye	129.3	15.9	145.2
“ “ ordinary	162.1	31.5	193.6
Snowflakes—one eye	136.1	45.4	181.5
“ “ ordinary	136.1	27.2	163.3
Average of one eye	186.3	35.8	222.1
“ “ ordinary	240.3	42.4	282.7
Excess of ordinary	54.0	6.6	60.6

The above table corroborates the previous with strong testimony. In every instance but one, ordinary cuts exceed in yield the one eye cuts. This was with Snowflakes, and is readily understood by all who know the character of this potato.

The excess in yield with ordinary cuttings is a fraction over 60 bushels per acre; omitting Snowflakes it is a fraction over 77 bushels.

It seems that this is quite conclusive evidence that under ordinary conditions the larger cuttings are superior to one eye, and enough superior to amply repay the extra outlay of seed. These were all close planting, $2\frac{1}{2} \times 1$ foot. The soil for these plots was not quite so fertile as for varieties.

In concluding the work on cutting of seed is presented the results in detail of a study of the vigor of the eyes of the tuber, as affected by position. For this work very choice tubers were selected, and the eyes carefully placed in regular order from the stem to the seed end. Every eye being used.

We remark here that in the ordinary one eye cutting, none but the eyes from the body of the potato where they could be cut with equal amounts of substance were used. Where possible, in the following table, the eyes are grouped into three equal sections, viz., butt, middle and tip; but where not, the middle section is given the larger number.

		No. of eyes on each section.	No. of large tubers from each section.	No. of small tubers from each section.	Total No. of tubers from each section.	Weight of large tubers from each section—ounces.	Weight of small tubers from each section—ounces.	Total weight for each section—ounces.	Total weight for each tuber—ounces.	Average weight for each piece planted—ounces.
Early Ohio	Butt	5	14	10	24	16.0	9.0	55.0	199.25	12.45
	Middle..	6	20	7	27	97.5	6.0	103.5		
	Tip	5	11	4	15	39.0	1.75	40.75		
Mam'oth Pearl	Butt	4	19	10	29	71.25	9.0	80.25	167.75	14.00
	Middle..	4	11	5	16	42.50	4.75	47.25		
	Tip	4	9	4	13	38.25	2.0	40.25		
Beauty of Hebron	Butt	5	21	11	32	69.75	6.75	76.5	212.25	13.26
	Middle..	6	29	8	37	88.50	6.50	95.0		
	Tip	5	10	3	13	37.75	3.0	40.75		
Burbank's—Mich. seed ..	Butt	9	48	24	72	118.75	17.0	135.75	385.25	14.30
	Middle..	9	38	6	44	156.60	2.50	158.50		
	Tip	9	28	7	35	87.25	3.75	91.0		
Burbank's—Station seed	Butt	8	23	11	34	89.50	9.25	98.75	380.00	15.20
	Middle..	9	44	10	54	185.0	8.25	193.25		
	Tip	8	24	8	32	80.0	8.0	88.0		
Snowflake	Butt	6	13	15	28	48.0	9.75	57.75	201.75	11.2
	Middle..	6	17	19	36	60.50	11.25	71.75		
	Tip	6	19	19	38	60.50	11.75	72.25		
O. K. Mam-moth Prolific	Butt	3	11	9	20	44.0	4.5	48.5	165.25	16.52
	Middle..	4	19	6	25	74.0	7.5	81.5		
	Tip	3	6	17	23	27.5	7.75	35.25		
Rural Blush ...	Butt	5	20	13	33	63.5	8.25	71.75	194.0	12.10
	Middle..	6	26	6	32	79.5	4.5	84.0		
	Tip	5	8	8	16	31.0	7.25	38.25		

TABLE OF AVERAGES.

	Average number of eyes to each section.	Average number large tubers to each section.	Average number small tubers to each section.	Average total number of tubers to each section.	Average weight of large tubers to each section—ounces.	Average weight of small tubers to each section—ounces.	Average total weight to each section—ounces.
Butt eyes.....	5.6	21.1	12.8	33.9	68.84	9.2	78.04
Middle eyes.....	6.2	25.5	8.3	33.8	98.00	6.4	104.40
Tip eyes.....	5.6	14.3	11.2	25.5	50.15	5.65	55.80

	Total number of eyes planted.	Average number of large tubers for each eye planted.	Average number of small tubers for each eye planted.	Total number for each eye planted.	Average weight of large tubers for each eye planted, ounces.	Average weight of small tubers for each eye planted, ounces.	Total weight for each eye planted, ounces.
Butt eyes	45	3.7	2.3	6.0	12.2	1.6	13.8
Middle eyes	50	4.1	1.3	5.4	15.7	1.0	16.7
Tip eyes	45	2.5	1.5	4.0	8.9	1.0	9.9

Of the eight varieties, the maximum yield occurred in the butt section four times, middle section four times, tip section no time. The minimum yield occurred in butt section two times, middle section no time, tip section six times.

To sum up the three preceding tables in a few words, we would say that the evidence would not warrant the use of whole seed, as this is very wasteful without a corresponding increase of crop; the argument in favor of it being principally a gain of a few days in ripening, and additional vigor to resist drouth, also increased yield. The general work tends to show that the yield of large tubers will not as a rule much exceed good ordinary cut seed.

Another objection is that large, whole seed produces a much larger quantity of small tubers.

The results do not sustain the use of one eye cuttings, this is very decided. This point is discussed more at length elsewhere. The advantage of cutting so as to maintain a supposed internal structure is not and has not in any of our experience been sustained. That ordinary cutting is best under general conditions, is clearly sustained. That eyes from certain parts of the tuber are more productive than others, is not sustained by a particle of evidence as would be seen if the whole record of yield from single eyes was given, but the general table given above illustrates this point sufficiently. The whole question of productiveness is so far as we can discern a matter of vigor, and the evidence is clear that this is largely influenced by size of cutting.

In the above table the central portion show the best yield and butt portion second.

We define ordinary cutting to mean never less than two eyes, except in very large tubers having few eyes when they are cut separate, and three eyes are not used, except in case of many eyed sorts.

The tip is never used in experiment work by us, unless so stated, but in ordinary culture it forms on piece. We always cut to the center, slanting the knife a little toward the butt of the tuber, turning it around as we progress; in this manner the most uniform cuttings can be made.

FERTILIZERS.

The soil for this work is similar to that for varieties, being an adjacent plot or plots. The size of plots and style of planting was also similar. It received no dressing of stable manure, but was ordinary well tilled and moder-

ately fertile soil. The fertilizers were applied to each plot separately after it had been laid off and furrowed to receive the seed, being in each case well worked into the soil.

The seed was White Elephant, cut two eyes to the piece, the seed end not being used. All were planted $2\frac{1}{2} \times 1$ ft., and four inches deep. The ripening was quite uniform, being slightly earliest with the plots showing best results.

The following table gives detailed results of fertilized and unfertilized plots :

Plot.	How treated.	Yield of large tubers.	Yield of small tuber .	Total yield.
		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
1	Special potato manure, 800 lbs. per acre...	235.9	61.3	297.2
2	Unfertilized	238.9	44.5	283.4
3	Special potato manure, 400 lbs. per acre...	297.2	31.8	329.0
4	Unfertilized	226.9	28.6	265.5
5	Special potato manure, 200 lbs. per acre...	294.9	36.3	331.2
6	Unfertilized	245.0	43.1	288.1
7	Muriate of potash, 800 lbs. per acre.....	243.6	32.8	276.4
8	Unfertilized	299.5	36.3	335.8
9	Muriate of potash, 400 lbs. per acre.....	231.4	32.8	264.2
10	Unfertilized	285.9	45.4	331.3
11	Muriate of potash, 200 lbs. per acre.....	322.2	45.4	367.6
12	Unfertilized	240.5	34.0	274.5
13	Superphosphate, 800 lbs. per acre	317.6	49.9	367.5
14	Unfertilized	304.0	40.9	344.9
15	Superphosphate, 400 lbs. per acre.....	326.7	47.6	374.3
16	Unfertilized	285.9	63.5	349.4
17	Superphosphate, 200 lbs. per acre.....	347.1	63.5	410.6
18	Unfertilized	288.1	59.0	347.1
19 {	Muriate of potash, 600 lbs. } per acre	184.8	26.4	211.2
	Sulphate of ammonia, 400 lbs.... }			
20	Unfertilized	231.4	54.5	285.9
21	Lime, 100 bushels per acre.....	174.4	38.6	213.0
22	Unfertilized	124.8	47.6	172.4
23	Lime, 50 bushels per acre	229.1	31.8	260.9
24	Unfertilized	172.4	38.6	211.0
25	Lime, 25 bushels per acre	186.0	29.5	215.5
26	Unfertilized	186.3	38.7	225.0
29	Hen manure, 5 tons per acre	227.5	29.0	256.5
30	Unfertilized	190.6	74.9	265.5
31	Hen manure, 2 tons per acre.....	222.6	53.2	275.8
32	Unfertilized	188.3	56.7	245.0
33	Wood ashes, 100 bushels per acre.....	195.1	40.8	235.9
34	Unfertilized	175.6	56.2	231.8
35	Wood ashes, 50 bushels per acre.....	181.5	43.1	224.6
36	Unfertilized	164.6	31.5	196.1
37	Wood ashes, 25 bushels per acre.....	145.2	36.3	181.5
38 {	Muriate of potash, 600 lbs.... } per acre...	159.2	28.1	187.3
	Wood ashes, 25 bushels..... }			
39	Unfertilized	186.0	45.4	231.4
40	Coal ashes, 20 tons per acre	170.2	27.3	197.5
41	Unfertilized	158.8	31.8	190.6
42	Coal ashes, 10 tons per acre	190.6	36.3	226.9
43	Unfertilized	182.7	46.8	229.5
44	Coal ashes, 5 tons per acre	180.3	39.8	220.1
45	Unfertilized	190.0	60.9	250.9
46 {	Muriate of potash, 600 lbs.... } per acre...	175.0	30.0	205.0
	Coal ashes, 10 tons..... }			
47	Unfertilized	217.8	34.0	251.8
48	Compost, 20 tons per acre.....	175.6	44.5	220.1
49	Unfertilized	242.0	40.3	282.3

Plot.	How treated.	Yield of large tubers.	Yield of small tubers.	Total yield.
		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
50	Compost, 10 tons per acre.....	288.1	51.1	329.6
51	Unfertilized	285.7	60.9	346.6
52 {	Compost, 10 tons	290.4	45.1	335.5
53 {	Muriate of potash, 400 lbs..... } per acre...			
53	Unfertilized	324.3	38.7	263.0
54	Guano, 800 lbs. per acre.....	266.2	48.4	314.6
55	Unfertilized	261.4	38.2	299.6
56	Guano, 400 lbs. per acre.....	281.3	36.3	317.6
57	Unfertilized	338.1	25.0	363.1
58	Guano, 200 lbs. per acre.....	379.6	25.0	404.6
59	Unfertilized	317.6	27.2	344.8
60 {	Guano, 400 lbs.....	305.4	25.0	330.4
60 {	Muriate of potash, 400 lbs..... } per acre...			

In order to get a good comparison from the above table, the following comparative table is arranged. This includes comparisons of results from the different substances used, with the unfertilized plots beside them.

No. plots treated.	How treated.	Average yield of large tubers.	Average yield of small tubers.	Ave'ge total yield.	Maximum total yield from each.	Quantity of fertilizer used per acre for maximum yield.
3	Special potato manure...	243.0	43.1	286.1	331.2	200 lbs.
3	Unfertilized	236.9	42.1	279.0	288.1	.....
3	Muriate of potash	265.7	37.0	302.7	367.6	200 lbs.
3	Unfertilized	275.3	38.5	313.8	335.8	.....
3	Superphosphate	330.5	53.6	384.1	410.6	200 lbs.
3	Unfertilized	292.6	54.5	347.1	349.4	.....
3	Lime	196.5	33.3	229.8	260.9	50 bu.
3	Unfertilized	161.1	41.6	202.7	225.0	.....
2	Hen manure	225.0	41.1	266.1	275.8	2 tons.
2	Unfertilized	189.4	65.8	255.2	265.5	.....
3	Wood ashes.....	173.9	40.1	214.0	235.9	100 bu.
3	Unfertilized	175.4	44.3	219.7	231.8	.....
3	Coal ashes	180.3	34.5	214.8	226.9	10 tons.
3	Unfertilized	177.1	46.5	223.6	250.9	.....
2	Compost.....	231.8	48.0	279.8	339.6	10 tons.
2	Unfertilized	263.8	50.6	314.4	346.6	.....
3	Guano	315.7	36.5	352.2	404.6	200 lbs.
3	Unfertilized	305.7	30.1	335.8	363.1	.....

Several plots of the preceding table are not included in the above, being those where mixtures were used.

That the fertilizers were, in some cases, injurious is plainly to be seen, but it is just as evident that in others they were decidedly beneficial. The cases of injury appear generally to be where the quantity used was excessive.

In order to furnish ample plots for comparison every other one was left unfertilized, except in one instance, where it was overlooked.

This gives an admirable basis of comparison, each series being composed of an equal number of fertilized and unfertilized plots. On this fact is based the comparative table above given. The average total yields are very close together, being as follows:

	Average yield.		Total.
	Large.	Small.	
Fertilized 30 plots	241.4 bu.	38.9 bu.	280.3 bu.
Unfertilized 28 plots.....	235.4 bu.	44.7 bu.	280.1 bu.

This is accounted for by the fact of the heavy application of fertilizer, in many cases reducing the yield below the unfertilized plots.

The maximum yields for fertilized and unfertilized plots compared show a difference, on the average, of 21.9 bushels in favor of the fertilized plots. This is certainly significant. The fact that certain plots of each series were injured by heavy dressing of fertilizer makes the comparisons of the general table above obscure, in a certain measure the beneficial effects of the fertilizer; hence, we give the following table, taking as the basis of production for each series the average of its unfertilized plots and of the fertilized plots, the one showing the maximum yield; this shows the fertilizer in the most favorable light.

No. plots treated.	How treated.	Total yield.	Excess over unfertilized plots.
		<i>Bu.</i>	<i>Bu.</i>
3	Special manure—maximum	331.2	
3	Unfertilized—average	279.0	52.2
3	Muriate of potash—maximum.....	367.6	
3	Unfertilized—average	313.8	53.8
3	Superphosphate—maximum.....	410.6	
3	Unfertilized—average	347.1	63.5
3	Lime—maximum	260.9	
3	Unfertilized—average	202.7	58.2
2	Hen manure—maximum	275.8	
2	Unfertilized—average	255.2	20.6
3	Wood ashes—maximum	235.9	
3	Unfertilized—average	219.7	16.2

No. plots treated.	How treated.	Total yield.	Excess over unfertilized plots.
		<i>Bu.</i>	<i>Bu.</i>
3	Coal ashes—maximum	226.9	
3	Unfertilized—average	223.6	3.3
2	Compost—maximum	339.6	
2	Unfertilized—average	314.4	25.2
3	Guano—maximum	404.6	
3	Unfertilized—average	335.8	68.8

It will be readily understood by all that an absolute standard by which all plots can be compared and their favorable or unfavorable results noted, can not be given, but the results should be studied and interpreted as seems most rational. If the common average of the 28 unfertilized plots were to be used for the standard the resultant increase of crop shown in the above table would vary much more than it does, as the table now is. In a few instances there would be a deficiency; that is, the maximum yield of some of the fertilized plots is not equal to the common average of unfertilized plots. We have learned in studying the subject of fertilizers that the important thing is comparison with adjacent unfertilized plots; hence, the large number of unfertilized plots in this work, and the above comparisons are, doubtless, as reliable in their teaching as any which could be made. Whether the maximum yield of fertilized plots should be taken in the comparison is the question most difficult to settle, but it is so evident from the results set forth in the general table that some of the plots did suffer from an excessive application of the fertilizer that it is not possible to obtain an average which shall truly represent the productive capacity of the fertilizer used. Hence the maximum yield is used, which, probably to some extent, exaggerates the benefits derived from the fertilizer.

An examination of the maximum yields of fertilized and unfertilized plots of each series shows that in all but two instances the fertilized plots exceed those not fertilized,—the average excess of yield being, as before stated, 21.9 bushels. The facts are clear that the fertilizers were, in most cases, beneficial. These results are the most pronounced in favor of fertilizers of any yet reported. To measure the benefit in stated values would be difficult, and, perhaps, the attempt to do so is uncalled for in this report. It is worthy of especial notice that the best results were produced in all important cases with the minimum amount of fertilizer. The results seem to show that under the conditions of this work fertilizers can be used with profit. The season was favorable to the use of fertilizers, the rainfall being quite abundant, producing vigorous growth throughout the entire season. The condition of the tubers was excellent.

The special manure, superphosphate and potash, were purchased of the Mapes Company, New York City. The first costing \$46.00 per ton, the second \$55.00, and the potash \$50.00 per ton. The guano cost also \$50.00 per ton.

The guano produced the greatest excess of yield, superphosphate next, lime, muriate of potash, and special manure following in the order named. What-

ever study or comparison is made from the foregoing results, it should be borne in mind that the tests were conducted on exceptionally well prepared soil, where it was supposed the productive capacity was nearly uniform. However, this last supposition was not borne out by the results, as it will be seen that the averages of groups four, five, six, and seven are considerably below the averages of other groups. This point is additional evidence in favor of comparing each group by itself, instead of with a common average.

We might add that in using stable manure, it should always be fairly well rotted and should be plowed under to a moderate depth. It has never injured the quality of the crop for us when so used.

The result with coal ashes stands at the foot of the list, so far as yield is concerned. Heretofore they have produced results equal to the best fertilizers. Altered mechanical conditions of the soil and climatic conditions doubtless account for this.

PIG FEEDING EXPERIMENT.

In the following work a comparison of pigs fed on corn and green food was undertaken. No attempt to definitely determine the relative values of the different green foods used was made.

The plan of the experiment was as follows:

One lot fed on corn and green food.

One lot fed on corn.

One lot fed entirely on green food.

One lot fed on corn, running at large in pasture.

At the same time a fifth lot was weighed and turned at large in one of the pastures with the rest of the herd. With this last mentioned lot no attempt was made to take account of their food. The whole herd received a small quantity of old corn until August 24th, when new corn was fed. The others were fed exact quantities of corn and green food and kept entirely from other stock. Lots one, two, and three were kept in closed pens, with a small yard attached, of which they had free range. Lot four was in an open field (an old pasture, principally blue grass sod,) of about three acres, and were provided with shelter from sun and rain. The green food eaten by this lot could not be measured, but otherwise their treatment was taken account of.

The pigs were eleven Berkshires and nine Poland Chinas,—a very even lot of pigs. They had not been overly kept, but were in fair, thrifty condition,—good stock pigs.

The two breeds were quite even as to age and size, all being about sixteen weeks old.

In order to have as large a number of individuals in each pen as possible we were compelled to use the two breeds together. This does not give any comparative test of breeds, but we think does not mar the general results of the work. We remark that they fed very evenly.

The twenty pigs were divided into five lots, according to the previous plan. Lots one to four were composed of equal numbers of the two breeds, lot five, three Berkshires and one Poland China. The first four lots were also equally divided as to sex, the fifth was all barrows.

The grain for first part of period was old corn fed on the ear, and worth 50 cents per bushel of 70 pounds. The latter part of the period was fed with green corn, as will be noticed further on. The green food fed to pens one and three was green peas, sown with oats on purpose for this work, clover and purslane. These will be mentioned along with the periods of feeding. We aimed to feed all of each food that the pigs would eat, and usually fed but twice a day, though oftener, if there was any show of hunger. The green stuff was weighed and put in a rack fastened to the side of the pen, from which the residue was weighed back when the pigs had eaten what they would. In this way we were able to tell very nearly the quantity eaten.

We had thought that green food fed in the pen with corn would probably not lessen the amount of corn eaten, but would add to the gain sufficient to more than pay its cost; also that green food of such excellent character, fed *ad libitum* in the pen, would maintain the pigs about in even flesh and permit of ordinary growth without the aid of corn or other food.

It is maintained by many that the model conditions for feeding pigs with profit is on pasture. The results of the work bear upon these points.

Weight of the Several Lots at Beginning of Test.

No. 1, 545 pounds; No. 2, 552 pounds; No. 3, 526 pounds; No. 4, 544 pounds; No. 5, 490 pounds.

These weights show them to have been a very uniform lot of pigs, except No. 5. One of this lot was rather small and accounts for the low weight. All appeared to be in healthy condition. They were put in their respective quarters July 2d and until the 30th were fed equal rations of corn, when they were reweighed and put upon the special feeding. Lot 5 is not considered in the general discussion which follows, except when especially mentioned.

Below are exhibited the results of the preliminary feeding period of eleven days. We call especial attention to these as showing conclusively that the several lots were quite evenly selected.

PRELIMINARY PERIOD—JULY 2D TO 12TH, INCLUSIVE. (11 DAYS.)

	Weight at commence- ment.	Weight at close.	Gain.	Corn eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	545	594	49	300
No. 2.....	552	602	50	300
No. 3.....	526	578	52	300
No. 4.....	544	598	54	300

The pigs all ate the same amount of corn. This was not especially desired, but as near as could be determined, they all had about what they would eat. The gain of the several lots is also very even, varying but five pounds between the extremes. Lot four, out in the pasture, took the lead in point of gain from the start, but their increased consumption of food is quite noticeable, as will be revealed in further tables. The aggregate gain during the preliminary period was 205 pounds, at a cost in corn of 5.85 pounds for each pound of increase, or four and one-tenth cents per pound. This cost was certainly above profitable production.

For convenience in noting the results of the feeding as it progressed, the time is mostly divided into periods of two weeks each, but naturally it divides itself into but two periods: First, during which dry corn was fed; second, during which green or new corn was fed.

PERIOD FROM JULY 13TH TO 26TH INCLUSIVE, 14 DAYS.

	Weight on first date.	Weight on second date.	Gain or loss+ or—.	Corn eaten.	Green food eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	594	640	+46	335	262
No. 2.....	602	666	+64	486	.....
No. 3.....	578	520	—58	.....	536
No. 4.....	598	678	+90	456	.....

In studying the increase of weight, the amount of corn eaten should be taken into consideration. It is to be observed that pen one consumed 151 less pounds of corn than pen two, but in lieu of it ate 262 pounds of green food (peas and oats), yet the less gain would indicate plainly that this green food did not take the place of corn in producing growth. With pen two about 7.6 pounds of corn produced one pound of increase, at this rate the 335 pounds eaten by pen one should have produced a trifle over 44 pounds increase. The facts are they gained 46 pounds, thus allowing two pounds for the feeding value of the peas, certainly not at all commensurate with the labor expended, growing and feeding them; comparing pen four with pen two on the same basis, they should have gained just 60 pounds, but they gained 90 pounds or one half more. Their gain being at the rate of one pound to five of corn eaten. These remarks are given as illustrating the manner in which this and subsequent statements of feeding should be studied. Pen three show an utter failure of our expectations to sustain them on green food. Pen four, it should be remembered, ate in addition to the 456 pounds of corn all the grass they chose to. The gain of this lot cost $3\frac{1}{2}$ cents per pound for corn. The peas fed to No. 3 during this period were in condition to furnish the maximum quantity of green food.

PERIOD FROM JULY 27TH TO AUGUST 9TH, INCLUSIVE.—14 DAYS.

	Weight on first date.	Weight on second date.	Gain or loss + or —.	Corn eaten.	Green food eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	640	708	+68	447	102
No. 2.....	666	742	+76	441	.....
No. 3.....	520	510	—10	.....	686
No. 4.....	678	754	+76	554	.....

In the above figures some of the points noted in remarks on previous period are reversed. Pen two made the best gain, but at a cost of four cents per pound, and pen four which made such a good record for last period costs over five cents for each pound of gain. Statements of cost are based simply on cost of corn. Pen three continued to decrease in weight, having lost now 68 pounds, or are 16 pounds lighter than at the beginning of preliminary period. Peas were used for the first seven days of this period and clover for the latter part. The clover was just coming into full bloom. Pen one as the record shows refused to eat much green food, and ate slightly more corn than No. 2.

The apparent contradiction in the results of the two periods illustrate the necessity of such work being conducted for a considerable length of time, and with duplicate tests for average results.

PERIOD FROM AUGUST 10TH TO 23D, INCLUSIVE.—14 DAYS.

	Weight at first date.	Weight at second date.	Gain.	Corn eaten.	Green food eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	708	756	48	362	225
No. 2.....	742	784	42	351	.....
No. 3.....	510	518	8	.....	790
No. 4.....	754	830	86	544	.....

The three lots eating corn shows a decidedly poor gain for corn eaten, No. 2 being the poorest, each pound of increase with them costing 5.8 cents. No. 4 did the best, each pound with them costing about $4\frac{1}{2}$ cents. Pen No. 3 show a small gain, their food was clover, peas and purslane, mostly the latter. The quantity consumed was considerable greater than heretofore, the purslane seeming to be especially relished. As to their slight gain, they had reached a very low ebb, and the enormous quantity of food eaten seems to have been sufficient to produce this, but all will recognize at a glance that it was totally insufficient to pay for care, no price being put upon the food.

Lot number five were weighed with the others at the close of this period as the farm were to begin feeding green corn to the herd, and we desired to know what their gain had been on pasture, with a small allowance of corn. It should be added that they had access to the cow-yards as well as the pasture, though but-little grain was being fed the stock at this time.

	Weight July 2d.	Weight August 23d.	Gain.	Time.	Gain per day for each pig.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Days.</i>	<i>Pounds.</i>
No. 5.....	490	580	90	54	.4

These conditions it appears were sufficeint to maintain growth. The increase of weight was evidently growth of frame, not flesh.

All of the pigs were apparently in good health. The low condition of pen 3 was the result of rations fed, and did not affect their general health as is abundantly proven by statements of future periods. It was now thought best to change their rations to corn with green food as the treatment had been carried on sufficiently long to demonstrate its failure.

It was necessary to feed them only part ration of corn for first week, as their gums seemed sore, and they ate with considerable difficulty; afterwards a full ration was feed.

PERIOD FROM AUGUST 24TH TO SEPTEMBER 13TH, INCLUSIVE.—21 DAYS.

	Weight at first date.	Weight at second date.	Gain.	Corn eaten.	Green food eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	756	828	72	515	400
No. 2.....	784	840	56	494	.....
No. 3.....	518	626	108	578	554
No. 4	830	942	112	975	.....

The time covered by this period is three weeks to make it end with the feeding of old corn. In fact new corn was fed Saturday and Sunday before the weights were taken Monday morning. Taking this period as a whole the gain is decidedly poor for pens one, two, and four and only fair for pen three, but we find from the data that the gain was very much better for the first two weeks of the period than for the last week.

Figures are given illustrating this. In showing the pounds of corn required for one pound of increase, no notice is taken of green food eaten as its value seems to have been small and cannot well be estimated.

	Pounds of corn consumed for one of increase, first two weeks.	Same for whole time.
	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	5.7	7.2
No. 2.....	8.5	8.8
No. 3.....	4.1	5.4
No. 4.....	5.0	8.7

Why the increase should be better for the first two weeks of this period, is not explained except in case of pen three which had just been placed on corn, and very naturally made a rapid gain from their emaciated condition. This matter is brought out thus prominently to illustrate what has often been observed before in feeding, that there are periods when it is done at a considerable loss.

PERIOD FROM SEPTEMBER 14TH TO 27TH, INCLUSIVE.—14 DAYS.

	Weight on first date.	Weight on second date.	Gain.	Corn eaten.	Green food eaten.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
No. 1.....	828	924	96	608	180
No. 2.....	840	920	80	519	.....
No. 3.....	626	744	118	782	160
No. 4.....	942	1050	108	832	.....

The new corn was picked from the stalk and was just passing out of "the milk." It was well relished by all the pigs. In equal bulk green corn weighed about one-third more than old corn.

If the weights of corn for the above period could be reduced to an equivalent weight of dry corn, it would give better data for determining its value in the experiment. This, however, is quite impossible, as it had a constantly changing value; but if we allow 30 cents for each 70 pounds, which is a liberal estimate, it shows quite advantageously for this period, making the gain per pound for the several pens cost 2.5 cents, 2.6 cents, 2.7 cents and 3. cents respectively.

Pen three made a gain during this period of a little more than two pounds per day for each pig, the largest gain made up to this date. The green food was as for previous period, but little of it being eaten with green corn.

With the close of this period, pens one and two pass out of the experiment. The summary of their record for the entire period will appear at the close.

For the remainder of the time pens three and four are given in one period. During this period of 22 days, pen three makes a gain of almost two pounds per day for each pig, and pen four slightly exceeds two pounds per day.

PERIOD FROM SEPTEMBER 28TH TO OCTOBER 19TH, INCLUSIVE.—22 DAYS.

	Weight at first date.	Weight at last date.	Gain.	Corn eaten.	Green food eaten.
No. 3.....	744 lbs.	910 lbs.	166 lbs.	1,040 lbs.	380 lbs.
No. 4.....	1,050 lbs.	1,230 lbs.	180 lbs.	1,709 lbs.	.....

The corn eaten during this period is especially heavy, but that it was new corn should be constantly borne in mind. The crop was already in shock at the close of this period, and the value of corn had considerably declined from the 50-cent basis with which it started.

The record of lot No. 5 is here presented for the period from August 24th to October 19th—56 days:

	Weight August 24th.	Weight October 19th.	Gain.	Time.	Gain per day for each pig.
No. 5.....	580 lbs.	902 lbs.	322 lbs.	56 days	1.4 lbs.

During this time these pigs with the rest of the herd received corn from the field in such quantities as they would eat up clean. They were fine pigs and went to the butchers on October 20th. The summary for all the pens and covering the entire time is here given.

GENERAL SUMMARY COVERING THE ENTIRE TIME OF THE EXPERIMENT.

Pen.	Weight July 2, pounds.	Weight Sept. 13, pounds.	Gain for first period, pounds.	Dry corn eaten, pounds.	Green food eaten, pounds.	Weight at close of test, pounds.	Gain for last period, pounds.	Green corn eaten, pounds.	Green food eaten, pounds.	Total corn eaten, pounds.	Total green food eaten, pounds.	Days of test.	Total gain, pounds.	Average gain per day for lot, pounds.	Average cost of gain per pound for whole time, cents.
1	545	828	283	2,150	989	Sept. 27, 924	96	608	180	2,458	1,169	88	379	4.3	4.6
2	552	840	288	2,265	.....	Sept. 27, 920	80	519	.....	2,484	.....	88	368	4.2	4.8
3	526	626	100	878	2,566	Oct. 19, 910	284	1,822	540	2,400	3,106	110	384	3.5	3.5
4	544	942 Aug. 24,	398	2,820	.....	Oct. 19, 1,230	288	2,541	.....	5,061	.....	110	686	6.2	4.3
5	490	580	90	.....	.....	Oct. 19, 902	322	.....	.....	.....	.....	110	412	3.7	.....

In the values given in the foregoing statement, dry corn is rated at 50 cents for each 70 pounds, or at 7 mills per pound, and new corn is given an average value of 30 cents for each 70 pounds, or 4 mills for each pound. The values 7 and 4 mills are very near the facts, and were used in obtaining the figures given above.

A few generalizations are drawn, as follows: Pen No. 2 ate 2,265 pounds of dry corn for first period on which they made a gain of 288 pounds. This pen were fed entirely on corn, hence we can, with assurance in this case, say 7.8 pounds of corn caused one pound of increase; taking this as a standard, pen No. 1 should have produced 275.6 pounds increase. Their actual increase was 283 pounds, or 7.4 pounds in excess of the calculated yield from the supposition that 7.8 pounds of corn unaided will produce one pound of increase. This difference is so slight as to furnish no basis whatever for conclusions as to the value of the green food eaten; of which it should be remembered this pen ate 989 pounds during the period. The cost per pound of increase for this period for pens 1 and 2, estimating only corn, was 5.3 cents and 5.5 cents, respectively.

During the 42 days, from July 13th to August 23d, pen 3 ate 2,012 pounds of green food and decreased in weight 68 pounds, but regained 8 pounds just at the close, so that they then weighed 60 pounds less than when the period began. This certainly shows it to be impracticable to attempt to grow pigs on green food alone. Being well aware that pigs can be and are frequently grown quite successfully on clover pasture without other food, but to attempt to keep them in growing condition in a pen seems from our experience impossible. This pen was August 23d 8 pounds lighter in weight than when the preliminary period began July 2d.

Their treatment from August 24th to the close is fully set forth in the tables. Omitting the green food entirely from the calculation, this pen shows an average cost for pound of increase $3\frac{1}{2}$ cents, the best showing of either of the four lots; this is because the corn used was principally green corn.

Pen 4 made a gain during the period fed on old corn of 398 pounds, over one hundred pounds more than either of pens 1 or 2, but it was at a cost of five cents per pound. This, however, is better than pens 1 and 2. For corn eaten, according to basis previously used in comparing pens 1 and 2, they should have made a gain of 361.5 pounds, but their gain exceeds this by 36.5 pounds. This excess is all that can be legitimately claimed as the value of the pasture.

For the period this pen were fed green corn, we have a gain of 288 pounds at a cost of $3\frac{1}{2}$ cents per pound. Pen 3 gained 284 pounds on green corn at a cost of a little over $2\frac{1}{2}$ cents a pound. Pens 1 and 2, for the short time on green corn, made reasonable gains at a cost of $2\frac{1}{2}$ cents per pounds for No. 1, and a trifle over that for No. 2.

When the pigs went to the butcher, No. 4 was certainly as fine a lot of pigs as we ever saw, and the others were in almost equally good condition.

CATTLE FEEDING EXPERIMENT.

During the latter part of the winter and early spring of 1885 a few simple tests of feeding milch cows were undertaken. The main object being to ascertain as far as possible the effect of changing the ration, and preparing it with greater care than usual, by introducing in a systematic manner a number of the most common feeding stuffs.

The work was begun February 1st and continued until April 25th. Five ordinary grade cows of the University herd were selected for the work and placed in stalls at one side of the cattle barn. The weights of the animals were taken once a week, on Saturday afternoon, before giving the evening feed. All were watered once a day with water warmed to 55° or 60° Fahrenheit. This they took sparingly at first, but afterwards with great relish, drinking much more than the other cattle did of water from the well or brook. The cows were given two or three hours' exercise each day, except when stormy. The cows in the dairy were receiving hay in the barn, corn fodder in the yard, and corn meal with beets additional to this rough feed.

This was taken as the ration for the first period. The fodder and hay were cut to half inch lengths and the corn meal mixed with it, all being fed together in the manger. The ration was as follows:

Cut hay,	12 pounds.	} Thoroughly mixed, dampened and fed in two feeds—morning and evening.
Cut corn fodder,	12 “	
Corn and cob meal,	8 “	
Sugar beets,	18 “	. Fed at noon.

Taking into consideration the high feeding value of the sugar beets, as shown by the chemist's analysis, this made a very fair ration for a cow of 1200 pounds live weight. The nutritive ratio of the beets was 1 : 5.2. This is a very high feeding value for roots, being to all purposes a perfect ration for milk production.

A chemical analysis of all the feeding stuffs was not made, and the ration is not discussed as to chemical composition, but it was always brought as nearly as possible from the stuff at hand to the standard milk ration for 1200 pounds live weight, which is here given: Dry matter, 28.8 pounds; protein, 3.0 pounds; fats, .48 pounds; carbohydrates, 15.0 pounds; nutritive ratio, 1 : 5.

It was thought that the above mixture of fodder, hay, and corn would be eaten more closely, or that the rough feed at least would, and thus increase its value over the ordinary method of feeding it. But in this we were disappointed, as the cows persistently refused to eat the coarse part of the fodder, and thus a part of the meal which adhered to it was lost, as was also some of the hay.

At the end of the first week it was found impossible to run our grinder longer and corn meal (seven pounds per day to each cow) was substituted for the eight pounds of corn and cob meal. At the end of two weeks a change was made in the manner of giving the ration but the ingredients were kept about the same.

Although the ration was fed with poor success in some respects yet the cows show a slightly increased flow of milk at the close of the two weeks over the average product before the test began.

The average temperature in the barn was 26° Fahrenheit.

The following tables present the entire record for the two weeks.

FEBRUARY 1ST TO 7TH, INCLUSIVE.

No. of cow.	Weight Feb- ruary 1st.	Weight Feb- ruary 7th.	Increase or decrease, + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1	1,260	1,226	-34	67 6	56 10	124 0	17 11½
2	1,100	1,096	-4	58 3	46 13	105 0	15 0
3	1,180	1,180	.....	84 5	72 8	156 13	22 63-7
4	1,298	1,270	-28	45 11	39 11	85 6	12 31-7
5	1,080	1,036	-44	103 0	83 11	186 11	26 105-7

FEBRUARY 8TH TO 14TH, INCLUSIVE.

No. of cow.	Weight Feb- ruary 7th.	Weight Feb- ruary 14th.	Increase or decrease, + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1	1,226	1,176	-50	67 15	56 0	123 15	17 112-7
2	1,096	1,090	-6	60 4	50 1	110 5	15 121-7
3	1,180	1,200	+20	86 9	75 2	161 11	23 14½
4	1,270	1,270	.....	37 15	35 4	73 3	10 72-7
5	1,036	1,062	+26	92 6	87 6	179 12	25 106-7

The cows do not average quite 1200 pounds live weight, but come so near this figure that the ration is properly calculated on this basis.

The variation in weight of animals from week to week is quite unaccountable, but apparently influences but little the flow of milk, unless, perhaps, it should be a steady decline.

The food used in the above ration was valued as follows: Hay, \$12 per ton; fodder, \$5 per ton; corn, 45 cents per bushel, (ears, 68 pounds, shelled, 56 pounds); beets, 10 cents per bushel of 40 pounds.

Total product of milk, 1,306 pounds and 12 ounces.

Value, at 3 cents per pound, \$39 20

Cost of food and labor, 25 20

Balance profit on milk, \$14 00

This allows nothing for marketing, which is a considerable expense, and the price (3 cents per pound) is much better than is obtained, except in cities. The actual amount of food eaten cannot be given, but the valuation is made of the whole amount fed.

Beginning with the third week the ration was changed as follows:

<i>Morning</i> —Cut hay, . . . 12 pounds.	} Mixed together and fed damp.
Corn meal, . . . 3½ "	
<i>Noon</i> —Beets, . . . 18 "	} Beets cut up in feed box and meal mixed with them.
Corn meal, . . . 3½ "	
<i>Night</i> —Cut fodder, . . . 15 "	} Fed dry.

This ration varies from the other only in quantity of fodder used and the manner of feeding it. By this method the food was eaten with good relish.

Of the coarse fodder, on an average, three-fourths of the total quantity given was consumed. The above ration was fed without change for two weeks with quite satisfactory results, except in amount of fodder eaten.

The average temperature in the barn was 22° for the first week, for second week, 34° Fahrenheit.

The following tables give the records of the cows in full for the two weeks.

FEBRUARY 15TH TO 21ST, INCLUSIVE.

No. of cow.	Weight February 14th.	Weight February 21st.	Increase or decrease. or —. +	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1	1,176	1,200	+24	71 14	56 6	128 4	18 51-7
2	1,090	1,090	.....	60 3	48 7	108 10	15 82-7
3	1,200	1,196	— 4	91 3	76 10	167 13	23 154-7
4	1,270	1,236	—34	38 9	35 13	74 6	10 10
5	1,062	1,070	+ 8	98 6	89 13	188 3	26 141-7

FEBRUARY 22D TO 28TH, INCLUSIVE.

No. of cow.	Weight February 21st.	Weight February 28th.	Increase or decrease. or —. +	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1	1,200	1,174	—26	69 14	56 0	125 14	17 155-7
2	1,090	1,064	—26	60 1	47 14	107 15	15 63-7
3	1,196	1,198	+ 2	89 8	73 3	162 11	23 36-7
4	1,236	1,226	—10	35 14	33 9	69 7	9 145-7
5	1,070	1,038	—32	108 8	83 3	191 11	27 61-7

The total product of milk for these two weeks is slightly in excess of previous period, being 1,324 pounds and 14 ounces. The cost of production is a little more for the extra amount of fodder used.

Very little success attended our efforts to make the animals consume the fodder more closely, but the hay was well eaten when cut and fed with meal. On the whole the ration produced quite satisfactory results in flow of milk. The previous rations with labor cost about 36 cents per day for each cow.

Following this, an attempt was made to introduce oat straw into the ration, and still preserve its balance by the use of more concentrated foods. This was hardly successful as it was impossible to get the cows to eat the straw, hence other food mixed with it was partially lost. The ration was arranged as follows:

<i>Morning</i>	—Cut oat straw	12 pounds.	} Mixed and fed dampened.
	Cotton seed meal	$\frac{1}{2}$ "	
	New process bran	3 "	
	Ground oats	2 "	
<i>Noon</i>	—Sugar beats	18 pounds.	} Beets cut into feed box and meal poured over them.
	Cotton seed meal	$\frac{1}{2}$ "	
	Bran	3 "	
	Ground oats	2 "	
<i>Night</i>	—Cut fodder	12 "	

Theoretically this was a good ration, but the straw was so little relished by cows accustomed to eating hay that the morning feed was partially lost, and changed after three days substituting 6 pounds of corn fodder for 6 pounds of straw, making equal amounts of straw and fodder in the morning feed, and the others remaining as above. This ration was continued for three weeks with a slight charge at the beginning of the third week, substituting 2 pounds of oil meal for the 1 pound cotton seed meal. This was done because the cows were dainty about eating the cotton seed meal even in such small quantities. The oil meal (old process) was eaten better. Also the meals were fed in the morning on 6 pounds of straw, and then 6 pounds of dry fodder given afterwards. This suited the cows much better, and the product of milk rose for the last week while the temperature and general conditions were not so favorable.

The following table gives the weights, etc., for the three weeks. The average temperature in the barn was 44°, 42° and 30° Fahrenheit for the three weeks, respectively.

MARCH 1ST TO 7TH, INCLUSIVE.

No. of cow.	Weight February 28th.	Weight March 7th.	Increase or decrease + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	lbs.	lbs.	lbs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
1.....	1,174	1,140	-34	61 0	51 5	112 5	16 05-7
2.....	1,064	1,058	-6	56 9	45 11	102 4	14 93-7
3.....	1,198	1,190	-8	83 0	67 1	150 1	21 7
4.....	1,226	1,240	+14	33 11	32 6	66 1	9 7
5.....	1,038	1,040	+2	93 2	76 8	169 10	24 35-7

MARCH 8TH TO 14TH, INCLUSIVE.

No. of cow.	Weight March 7th.	Weight March 14th.	Increase or decrease. + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	lbs.	lbs.	lbs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
1.....	1,140	1,140	.....	63 4	50 14	114 2	16 46-7
2.....	1,058	1,102	+44	58 1	45 8	103 9	14 125-7
3.....	1,190	1,240	+50	79 11	64 13	144 8	20 102-7
4.....	1,240	1,292	+52	32 14	29 14	62 12	8 153-7
5.....	1,040	1,058	+18	89 9	74 3	163 12	23 62-7

MARCH 15TH TO 21ST, INCLUSIVE.

No. of cow.	Weight March 14th.	Weight March 21st.	Increase or decrease. + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	lbs.	lbs.	lbs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
1.....	1,140	1,180	+40	64 14	52 14	117 12	16 13 1-7
2.....	1,102	1,094	- 8	58 3	45 9	103 12	14 13 1-7
3.....	1,240	1,234	- 6	88 0	71 11	159 11	22 13
4.....	1,292	1,306	+14	32 0	28 12	60 12	8 10 6-7
5.....	1,058	1,056	- 2	89 0	72 14	161 14	23 2

The total product of milk was as follows: First week, 600 lbs., 5 oz., a marked decline; second week, 588 lbs., 11 oz.; third week, 603 lbs., 11 oz. The better results of the last week were doubtless due in part to the increase of oil meal over cotton seed meal, and the manner of giving the ration, as there was no refuse when the meals were fed on 6 pounds of straw alone. The 6 pounds of dry fodder fed afterwards was also eaten quite well. The ration for the past three weeks with labor cost but little more than the previous one, being 36 to 40 cents for each cow. In this work the allowance for labor is 15 cents per day for each cow, which is much larger than actual cost would be in an ordinary dairy. During the summer a quantity of oat hay had been made in order to have a sample for analysis, and also to observe whether stock would eat it with relish. This was weighed, and it was ascertained that there was enough to feed the five cows for one week, hence a ration was arranged as follows:

Cut oat hay,	12 pounds.	} All mixed, dampened, and fed in two feeds, morning and evening.
Cut oat straw,	12 "	
Oil meal,	2 "	
Bran,	6 "	
Ground oats,	4 "	} At noon.
Sugar beets,	18 "	

This ration was well eaten, very little being left as refuse. It was not fed long enough to practically observe its effect on the flow of milk, but from the appearances we would judge oat hay to be a valuable fodder and easily grown to supplement the hay. The value of the straw is a question of considerable doubt; while it was well eaten with equal quantities of oat hay, the flow of milk fell to the lowest point yet reached.

MARCH 22D TO 28TH, INCLUSIVE.

No. of cow.	Weight March 21st.	Weight March 28th.	Increase or decrease, + or -.	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1.....	1,180	1,206	+26	64 3	53 0	117 3	16 11 6-7
2.....	1,094	1,086	- 8	52 10	42 13	95 7	13 10 1-7
3.....	1,234	1,240	+ 6	79 8	70 5	149 13	21 6 3-7
4.....	1,306	1,310	+ 4	29 10	27 0	56 10	8 1 3-7
5.....	1,056	1,084	+28	83 14	78 9	162 7	23 3 2-7

The total product of milk for the week was 581 pounds, 8 ounces. Average temperature in the barn, 38° Fahrenheit.

This ration could not be continued longer for want of oat hay.

It was now intended to arrange a ration, the coarse feed of which should be clover hay, but it was impossible to get a good sample, so this had to be abandoned after one week's trial.

The ration, as arranged, was :

Cut clover hay, 20 pounds.	} Fed in two feeds, morning and evening, with 18 pounds of sugar beets at noon.
Corn meal, 7 "	

The cows could not be induced to eat the poor hay and a different ration was arranged. The record of the work is given, however, to avoid a break in the data.

MARCH 29TH TO APRIL 4TH, INCLUSIVE.

No. of cow.	Weight March 28th.	Weight April 4th.	Increase or decrease, + or -.	Total weight of milk.	Weight of milk.		Average daily product.
					A. M.	P. M.	
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1.....	1,206	1,220	+14	62 6	52 14	115 4	16 7 3-7
2.....	1,086	1,094	+ 8	49 13	40 6	90 3	12 14 1-7
3.....	1,240	1,256	+16	81 6	69 5	150 11	21 8 3-7
4.....	1,310	1,332	+22	29 11	25 15	55 10	7 15 1-7
5.....	1,084	1,086	+ 2	82 12	78 0	160 12	22 15 3-7

The total weight of milk was 572 pounds, 8 ounces. The cost of the ration for each cow per day was 14 to 16 cents, not including care.

A ration was now arranged, which, for nutritive value, exceeded any yet fed, but the sugar beets were omitted from it. It was as follows :

Cut timothy hay, . . . 18 pounds.	} Mixed and fed in two feeds, in the morning and evening.
Ground wheat, 8 "	
Oil meal, 2 "	

The hay was excellent. The wheat had been injured in storage, yet the feeding value was not materially affected.

Omitting the beets left the cows without a noon feed, and a small quantity of the ration was placed in the box at noon in lieu of the beets. After the first week the wheat was increased to 10 pounds per day. The cost of this ration was 28 to 30 cents, not including labor. It was fed for three weeks and eaten with great relish by all the cows. The detailed results are set forth in the following table:

APRIL 5TH TO 11TH, INCLUSIVE.

No. of cow.	Weight April 4th.	Weight April 11th.	Increase or decrease, or +	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1.....	1,220	1,172	-48	60 14	51 4	112 2	16 02-7
2.....	1,094	1,050	-44	52 3	43 9	95 12	13 106-7
3.....	1,256	1,242	-14	74 12	65 1	139 13	19 154-7
4.....	1,332	1,300	-32	27 8	25 7	52 15	7 9
5.....	1,086	1,090	+4	87 5	80 0	167 5	23 143-7

APRIL 12TH TO 18TH, INCLUSIVE.

No. of cow.	Weight April 11th.	Weight April 18th.	Increase or decrease, or +	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1.....	1,172	1,176	+4	59 10	49 10	109 4	15 95-7
2.....	1,050	1,048	-2	50 7	42 6	92 13	13 41-7
3.....	1,242	1,248	+6	73 4	63 0	136 4	19 73-7
4.....	1,300	1,310	+10	25 11	23 14	49 9	7 12-7
5.....	1,090	1,100	+10	88 12	79 8	168 4	24 04-7

APRIL 19TH TO 25TH, INCLUSIVE.

No. of cow.	Weight April 18th.	Weight April 25th.	Increase or decrease, or +	Weight of milk.		Total weight of milk.	Average daily product.
				A. M.	P. M.		
	Lbs.	Lbs.	Lbs.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
1.....	1,176	1,184	+8	57 11	51 9	109 4	15 95-7
2.....	1,048	1,056	+8	50 7	47 0	97 7	13 145-7
3.....	1,248	1,254	+6	61 10	63 8	133 2	19 02-7
4.....	1,310	1,306	-4	25 3	24 10	49 15	7 16-7
5.....	1,100	1,090	-10	88 2	82 1	170 3	24 5

The total product of milk was, for the three weeks respectively, 567 pounds, 15 ounces, 556 pounds, 2 ounces and 559 pounds, 15 ounces.

It was expected that this ration would under the favorable conditions of mild weather produce a better flow of milk than the above showing. It suggests that the value of beets in a ration for milk production is much greater than their estimated feeding value.

The above ration was sufficiently high in nutritive value to have maintained a full flow of milk, unless there were attributed special value to the beets as milk producing food. Analyses of the corn fodder, oat straw and oat hay used in the above work will be found in the report of the chemist.

The foregoing work based on an attempt to so manipulate the common coarse foods, and by-products, as to make a complete ration from them leads to the following conclusions. That coarse heavy corn fodder cannot safely be mixed with meals or concentrated foods as loss from the refuse not eaten is quite sure to result. The smaller portion of the stalks and the leaves are well eaten and their value would be materially enhanced if they could be separated from the coarser portion.

It is very desirable to feed the concentrated foods with the coarser as this secures better digestion by insuring remastication. Possibly if the whole mass could have been steamed it would all have been eaten. This we were not prepared to test. It seems evident that straw, though it can be so managed that stock will eat it is detrimental to a milk ration.

There is no doubt that beets have a much greater value in a milk producing ration than their estimated feeding value would indicate. Of these, Lane's Imperial Sugar beet seems to be one of the best. Over 20 tons of this variety have been grown per acre here. Warm water for milch cows apparently adds to the general conditions of success, and aids digestion by preserving the stomach from the shock caused by drinking cold water. Much more water is taken when warmed than of cold. In arranging a ration the first thing to be sought is not what foods will furnish the ingredients, theoretically necessary, but what will furnish them at least cost in a practicable form for feeding.

SOILING CATTLE.

Six cows were selected from the farm herd in August, and for a little over one month so handled as to test the value of soiling for cows. Three of the cows were kept in a closed yard where they were fed three times a days such quantities of green food as they would eat, the other three were left with the dairy herd on excellent green clover pasture.

The condition of the herd for good results could not have been bettered, hence it was a favorable time to compare their results with stock fed in the yard.

The following table presents in a brief, comprehensive view the milking records of the cows. The time is divided into several periods, and these are not of equal length, but the number of days for each period is given, and the averages per day for each period also, from which all comparison must be made.

Cows one, two, and three were fed in yard, and numbers four, five, and six were with the herd in pasture.

The animals selected were all good, fair milkers, common stock and grade animals. Those kept in the yard show from the first a less total yield of milk than those in the pasture. The comparison, however, is not based on total yield, but on the ability of each cow to maintain her daily average up to the amount she was giving at the beginning of the test.

	Cow No. 1.					Cow No. 2.					Cow No. 3.					Green food eaten.	Av. weight of green food given each cow per day				
	Milk.		Total.			Average per day.		Milk.		Total.			Average per day.		Milk.			Total.			
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.			P. M.	A. M.	P. M.	A. M.	P. M.
August 18th—24th, inclusive—7 days.....	lbs. 55 11	oz. 69 8	lbs. 125 3	oz. 17 14½	lbs. 82 12	oz. 89 15	lbs. 172 11	oz. 24 10¾	lbs. 83 12	oz. 96 14	lbs. 180 10	oz. 25 13	lbs. 167 9	oz. 26 4½	lbs. 264 2	lbs. 133					
August 25th—30th, inclusive—6 days.....	44 11	47 6	91 1	15 3	67 12	73 11	141 7	23 9½	78 8	79 1	157 9	26 4½	264 2	146							
September 1st—5th, inclusive—5 days.....	38 2	47 2	85 4	17 1	61 9	49 1	110 10	22 2	74 12	71 1	145 13	29 2¾	225 4	150							
September 7th—14th, inclusive—8 days.....	59 1	57 5	116 6	14 9	81 8	83 11	165 3	20 10½	110 6	115 12	226 2	28 4½	426 0	177							
September 16th—19th, inclusive—4 days.....	25 0	27 13	52 13	13 3½	38 6	41 8	79 14	19 15½	45 9	59 4	104 13	26 3½	1322 110								
	Cow No. 4.					Cow No. 5.					Cow No. 6.										
	Milk.		Total.			Average per day.		Milk.		Total.			Average per day.		Milk.		Total.				
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.		P. M.	A. M.	P. M.	A. M.	P. M.
August 18th—24th, inclusive—7 days.....	lbs. 80 3	oz. 80 8	lbs. 168 13	oz. 24 2	lbs. 147 9	oz. 119 15	lbs. 267 8	oz. 38 3¾	lbs. 105 12	oz. 83 7	lbs. 189 3	oz. 27 ½									
August 25th—30th, inclusive—6 days.....	78 4	73 37	151 7	25 4	117 10	100 7	218 1	36 5½	93 2	74 14	168 0	28 0									
September 1st—5th, inclusive—5 days.....	72 6	64 7	136 13	27 6	107 8	86 6	93 14	38 12½	83 5	63 1	146 6	29 4½									
September 7th—14th, inclusive—8 days.....	107 13	97 1	204 14	25 10	161 12	130 14	292 10	36 9½	118 9	103 12	222 5	27 12½									
September 16th—19th, inclusive—4 days.....	51 5	49 11	101 00	25 4	77 13	64 13	141 10	35 6½	64 8	46 14	111 3	27 13½									

*1122 pounds was millet, all the rest was fodder of sowed corn.

† The amount of green food was increased until this period, when it was evident the cows were wasting it.

The figures in the column of averages of the above table shows the following facts: that cows feed in the yard decreased in the flow of milk during entire period just three pounds on a general average of daily product, and that cows on pasture decreased four and a half ounces on general average during the entire period. Certainly not a bad showing for soiling.

The yard in which the cows were kept is a dry, straw yard devoid of shelter of any kind from storm or sun, and they were ill at ease under these conditions, while the cows at large in the pasture enjoyed the most perfect contentment. An examination of the individual records will be found interesting.

The millet was fed but for the one period. It was in full bloom at the time. The cows wasted it more than they did the green fodder. The fodder was sowed corn, and was coming in tassel when we began to feed it. There were several plots of it sowed at different times, so that it was not fed at all after it got beyond full tassel.

The green millet yielded at the rate of 12,800 pounds per acre, and the green sowed corn 34,000 pounds per acre.

The old system of pasturing is not consistent with an advanced and progressive agriculture, and the time is not far distant when nearly all the food of cattle will, in the State of Ohio, be cut and fed to them. It is perfectly safe to say that almost any farm within the borders of our State will carry twice as much stock if this latter plan was pursued. A general change from pasturing to soiling would double the gross receipts, and would add largely to the net income of many a stock and dairy farmer. To allow cattle to run at large over good meadow land is wasteful, and unthrifty and improvident. Half the number of acres will feed the same amount of stock, and keep them in better condition if the product be cut and placed before them.

Rye, orchard grass, clover, millet, sowed corn, sorghum, and other crops can be cheaply and profitably grown, for the purpose, and each fed in its season.

With a good one horse mower and cart one man can easily cut and feed the daily ration of a herd of twenty head in an hour's time.

Fencing is one of the heaviest taxes the average Ohio farmer has to pay. It is mainly self-imposed, and in most cases needless, but it is the necessary consequence of a radically wrong system.

REPORT OF THE HORTICULTURIST.

EXPERIMENTS WITH SMALL FRUITS.

The only fruit plants in bearing on the Station's grounds are strawberries and raspberries, except a few well known varieties of gooseberries, currants and cherries. A vineyard has been planted, but the vines were severely injured by the cold, and bore but little fruit. Several varieties of apple and pear trees are just coming into bearing. Some of the latter are to be top-grafted with new varieties the coming spring.

Especial efforts have been made to secure new varieties as soon as introduced, and a considerable number have been obtained before they were offered for sale. Originators of fruits usually seem to be quite willing to send new varieties here for trial, and in some cases express the desire to have their productions fully and thoroughly tested before offering them to the public. Originators of new varieties seldom receive adequate compensation for their labors, but they rarely, and perhaps never, try to impose upon the public by sending out varieties that are known to be worthless. That their productions do not always prove to be valuable is usually a source of greater disappointment to them than to the public. If they were able to have their new sorts thoroughly tested, and the worthless ones rejected, it is safe to say that the majority of the originators would gladly avail themselves of the privilege. On the other hand, dealers seldom manifest much interest in having their new sorts tested, for the reason that the decision comes too late to benefit them. They usually have such sorts in their possession for a very limited time before offering them for sale, and when once put upon the market there is no time for a test to be made, as the stock must be sold in a short time. This accounts for the unseemingly haste in pushing new sorts regardless of their value. A trial of a variety after introduction may benefit the public, but is usually of little interest to the dealers. If, however, varieties could be tested while in the hands of the originators, dealers would be quite as much interested in the results as is the public. It would tend to lessen the number sent out, but increase the chances of profitable sale.

The Station is ready to co operate with originators in this work. Varieties will be taken on trial, and reported upon to the owner from time to time, but no report will be made public, except at the option of the owner, until offered for sale. Plants sent here for trial are not disposed of in any way, nor are they propagated except for experimental purposes. Old sorts are planted along side the new for comparison; treated and reported upon in the same manner. This doubtless is the only rational method that can be pursued, although it necessitates the growing of many kinds that have been fully tested and whose merits are well known.

STRAWBERRIES.

The soil upon which the plants were grown is a clay loam, sufficiently rich to produce a fair crop of corn without the use of fertilizers. One bed was planted in the spring of 1883, and bore a crop the following season; hence, the crop of 1885 was the second. The runners had been allowed to take root, forming matted rows. No cultivation was given, but the weeds were removed by hand-pulling and cutting with the hoe. Another bed, of the same and a number of new varieties was planted on similar soil in another field in the fall of 1884. No runners were allowed to take root. Both beds were mulched with wheat straw in the fall of 1884. This material was allowed to remain on the beds, being merely parted over the rows in the spring to permit the plants to come through. Two other beds, planted with the leading varieties, were also in bearing. These several beds in fruit at the same time gave opportunities for comparison, and served as a means to check errors that might have occurred had the notes been taken from one bed alone.

The season was unusually favorable, the rainfall in June being 4.84 inches. During the same period in 1884 it was only 1.11 inches. This difference in the rainfall of the two seasons will account for some of the discrepancies that occur in the reports. The disagreements are, however, by no means as great as might be expected, and are confined mostly to the variable or unreliable varieties.

Comparative Time of Blooming and Ripening of Fruit.

Table I. gives the dates of first appearance of bloom, the first ripe fruit, and the last ripe fruit; also, the number of days in bearing of the newer and many old varieties. This is a comparative showing, merely, as the actual time of blooming and ripening varies with the locality and from year to year in the same locality. The difficulty in making such tables exists in the fact that a few blossoms or a few ripe berries may often be found several days before any number appear, hence some of the dates given are approximations, within, perhaps, a day or two of the actual time. This does not, however, greatly impair the usefulness of the table. It will be especially valuable for the purposes of selecting varieties for a succession of fruit and in showing what perfect and imperfect flowering sorts bloom at the same time.

Relatively, the table agrees very closely with that given last year, the most notable exception being the difference in length of time in bearing of some varieties. This is due largely to the favorable season. Doubtless a mean would more nearly represent the truth. It will be noted that those varieties that have proved to be the most reliable in all sections are those that have the longest season. Possibly there are a few exceptions to this rule, but it is safe to say that no variety having an extremely short season has proved to be desirable, and the best are found among those having a long season.

Imp. is used to designate those varieties that have abortive stamens, the anthers of which contain little or no pollen. P. designates those having perfect flowers.

TABLE I.—DATE OF FIRST BLOOM AND OF FIRST RIPE FRUIT.

Name of variety.	First appearance of bloom.		First ripe fruit.		Last ripe fruit.	No. of days in bearing.
Alpha, P	May	10	June	2	June 25	23
Atlantic, P.		14		8	25	17
Arnold's Pride, P		13		5		
Bidwell, P		12		8	June 27	19
Black Giant, P		18		8		
Captain Jack, P		12		9	July 2	21
Cornelia, Imp		18		15	10	25
Cumberland, P		15		8	4	26
Champion, (Windsor Chief) Imp		16		6	2	26
Charles Downing, P		14		6	2	26
Crescent, Imp		10		2	1	29
Daniel Boone, Imp		14		5	June 25	20
Daisy Miller, P		14		8		
Emerald, P		14		10		
Early Canada, P		10		2	June 27	25
Endicott Seedling, P		14		8	27	19
Finch, P		12		8	July 1	23
Ford's Seedling, P		15		6	1	25
Gypsy, Imp		12		6	1	25
Golden Defiance, Imp		16		10		
Hart's Minnesota, P		12		10	July 6	26
Hovey, Imp		16		12		
Indiana, P		14		6		
Jersey Queen, Imp		16		9	July 6	27
James Vick, P		12		6	June 25	19
Jewell, Imp		16		6		
Kentucky, P		18		15	July 10	25
Lacon, P		12		9	1	22
Miner's Prolific, P		12		6	1	25
Manchester, Imp		13		8	1	23
Mt. Vernon, P		16		11	6	25
Maggie, P		12		12	1	19
Mrs. Garfield, P		14		8	June 27	19
New Dominion, P		12		8	July 1	23
Norman, P		12		5	June 27	22
Oliver Goldsmith, P		14		8	27	19
Old Ironclad, P		12		5	27	22
Photo, Imp		14		2	July 1	29
Prince of Berries, P		18		12	4	22
Piper's Seedling, P		10		6	June 25	21
Parry, P		13		3		
Ray's Prolific, P		15		5	July 4	29
Russell's Advance, P		18		12	10	28
Sucker State, P		16		11	8	27
Sharpless, P		14		8	2	24
Vineand, P		14		8		
Wilson, P		14		5	June 27	22
Woodward, P		12		10	July 1	21

Comparative Size of Berries of Different Varieties.

Very careful and full notes were taken on the size of berries of all varieties, with a view to obtaining trustworthy means of comparison. No effort has been made to select the largest specimens possible, but rather to take an average size. At each picking ten or more berries of about an average size were weighed and measured.

Table II. is made up by taking an average of these weights and measurements and doubtless represents a fair comparison of varieties, but should not be taken as an index of what any particular variety may do under more favorable circumstances. With few exceptions, however, the showing is about as good as may be expected under ordinary cultivation. Cumberland, Downing, Jewell, Sharpless, and Champion would probably make a better showing in most seasons.

They certainly do not appear to as good advantage as they have been made to do elsewhere. The Sharpless and Downing never have done well here. The plants of the Jewell were set the fall previous and the plants bore too heavily to perfect the crop, which reduces the average. The berries of the Cumberland and Champion were from old beds. The Crescent apparently stands too high, but the notes are given as taken. On the whole, the table doubtless represents with considerable accuracy the average size for the whole season.

TABLE II.—COMPARATIVE SIZE AND WEIGHT.

Name of variety.	Weight of 100 berries.	Average diameter.
	<i>Ounces.</i>	<i>Inch.</i>
Atlantic	25.	7-8
Arnold's Pride	21.25	15-16
Alpha	23.75	1
Bidwell	26.25	1
Black Giant.....	25.	1 1-8
Crescent	30.	1 1-4
Columbus Wilson	20.	1
Captain Jack.....	22.25	1 1-16
Cornelia	28.	1 1-12
Cumberland	32.	1 3-8
Champion (Windsor Chief).....	22.	1
Chas. Downing.....	30.	1 1-4
Daniel Boone.....	20.	15-16
Early Canada	20.	1
Emerald	25.	1
Finch.....	25.	1 1-8
Gypsy	20.	1
Golden Defiance.....	26.25	1 1-4
Grand Duke	10.	5-8
Hart's Minnesota.....	27.	1 1-8
Huddleston's Favorite.....	25.	1
Indiana	22.5	7-8
Jersey Queen	40.	1 1-3
Jewell	40.	1 2-5
James Vick	18.	7-8
Kentucky.....	32.	1 1-4
Lacon	29.	1 1-5
Mrs. Garfield.....	10.	9-16
Maggie	28.	1 1-4
Miner's Prolific.....	35.	1 1-5
Mt. Vernon.....	25.	1 1-16

TABLE II.—Continued.

Name of variety.	Weight of 100 berries.	Average diameter.
	Ounces.	Inch.
Manchester	31.	1 1-8
Norman	26.25	.....
New Dominion	18.	1
Oliver Goldsmith	22.5	1 1-8
Old Iron Clad	27.5	1 1-4
Prince of Berries	25.	1 1-8
Piper's Seedling	25.	1 1-16
Piloto	25.	1 1-4
Parry	25.	1 1-16
Pantuxet	25.	1
Primo	25.	1 1-16
Ray's Prolific	22.5	1 1-8
Russel's Advance	33.	1 1-4
Satin Gloss	18.	15-16
Sharpless	36.25	1 1-4
Sucker State	30.	1 1-5
Vineland	28.	1
Woodward	23.	1

NOTES ON VARIETIES.

It seems unnecessary to give detailed descriptions of varieties, except those that were not mentioned last year. A number of varieties not yet offered for sale are on trial, but it is not thought best to give an account of them until they are introduced.

Many of the statements may appear to be of local interest merely, but they will at least be useful in all sections to serve as comparisons. In some sections the rust is less troublesome than here, but as it is likely to appear in any locality, in favorable seasons for its development, some notes are given concerning varieties that are subject to it. It appeared much worse on an old bed, where the mulch was allowed to remain during the previous summer, than upon beds where the straw was removed and the ground cultivated.

Alpha.—This variety has been retained for comparison, because of its earliness. The foliage is usually quite vigorous and healthy, but last season it rusted considerably, and many of the berries did not mature. It is but little, if any, earlier than the Crescent, and much less productive, while the berries are no larger. There is no reason for retaining it longer.

Atlantic.—Appears to have no qualities that make it worth retaining on the list. Although the fruit is bright and glossy, the large calyx renders a box of the berries rather unattractive. The plants are healthy but unproductive; hence, it cannot become a profitable variety.

Arnold's Pride.—Plants quite vigorous, slightly affected by rust, unproductive. Further trial may show that this variety has some good qualities, but at present it seems likely to be dropped from the list.

Bidwell.—This variety has been on trial long enough to establish the fact that it is unworthy of cultivation. Reports concerning it from nearly all sections are unfavorable. The plants have a tendency to overbear, hence many of the berries are small and do not mature, and present a seedy, unattractive appearance. The berries color slowly and often rot before fully mature. When left about a week without picking, about one-half of the fruit was found to have rotted.

Big Bob.—Although this variety did much better than in 1884, the verdict given then cannot be reversed. It has not sufficient merit to be retained.

Charles Downing.—In many localities this is a deservedly popular variety. The only reason for its partial failure here is because the plants are much affected by the rust. Where the rust is not troublesome it may be classed as one of the most profitable sorts.

Captain Jack.—In some sections this is regarded as a good variety to plant with the Crescent, but there are others that furnish as much pollen and far better fruit. The plants rust badly, the fruit is small and of poor quality. It is not deserving of further trial.

Cornelia.—Has all the merits that have been claimed for it, as to size of fruit and lateness, but the plants are somewhat lacking in vigor and productiveness. The fruit is firm and keeps a long time on the vines. With rich soil and good cultivation this may prove to be a very profitable late variety.

Crescent.—Still maintains the reputation of being the best market variety. In localities where the strawberry does exceptionally well, and near markets where large berries are demanded at paying prices, it may not be the most profitable sort to grow, but the fact that under unfavorable circumstances it will yield a good crop when most other varieties fail, makes it deservedly popular. It will not only succeed where most others fail, but will respond more readily and certainly to good treatment than almost any other sort. The average size of the berries as shown by measurements taken at every picking throughout the season is but little less than that of some of the varieties that have a reputation for large berries. The fruit lacks in firmness and quality, hence a variety without these failings, and as productive and sure as the Crescent, is much to be desired.

At present the most important question with most small fruit growers is what perfect flowering sorts to plant with it to furnish pollen. As may be seen by reference to table I, there are several early blooming sorts, of which Alpha and Early Canada are perhaps the best. Only a few plants of these will be required. The best variety on the list is probably Miner's Prolific which blooms quite early. It is doubtless well to plant also some of the later flowering varieties, such as Chas. Downing, Kentucky, Sharpless and Sucker State.

Cumberland.—The plants are healthy and vigorous, but quite unproductive. Rows alongside the Crescent yielded less than one-fourth as much fruit as that variety. As a market sort it can only be profitable where good prices can be realized for fine berries. For home use it is unexcelled. The berries are large, easily picked and of good quality. Amateurs will find this one of the most satisfactory sorts to plant.

Champion (Windsor Chief).—A profitable variety in this and many other sections. The plants are healthy and productive; fruit of good size and fine appearance, but rather soft; quality medium. Well suited for near market. Plants received from A. M. Purdy were mixed with an inferior staminate variety, but those from Matthew Crawford were wholly pistillate. The fact that many spurious plants have been sent out doubtless accounts, in part at least, for conflicting reports.

Daniel Boone.—In 1884 this variety gave indications of being very promising, but the past season under more favorable circumstances it did not do nearly so well. The plants are healthy and fairly vigorous, but apparently unproductive.

Daisy Miller.—Was fruited from fall set plants only. The growth of the plant was feeble, while the fruit was very small and inferior. It seems to possess no qualities that should entitle it to further notice.

Emerald.—Fall set plants made a fair growth, and produced a number of

medium sized berries of quite good quality. Further trial is necessary before a verdict as to its merits can be given.

Early Canada.—The berries are smaller than the Crescent and ripen no earlier. The plants are only moderately productive. Does not possess sufficient merit to be retained.

Finch.—Where the Manchester succeeds, this is a good variety to plant with it as a fertilizer. The berries are of good size and have a fine appearance. The flowers furnish a large amount of pollen. Were the plants somewhat more productive it would be one of the leading varieties.

Ford's Seedling.—A new variety to be sent out next season. The plants resemble those of the Chas. Downing, having somewhat of the same tendency to rust, but apparently in a less degree. In productiveness, size and appearance of fruit it is equal and perhaps excels that well known variety. It will doubtless prove to be an acquisition.

Gypsy.—The very regular and even size and good quality of the fruit render this a very excellent sort for home use. The plants are very dwarf in habit, but healthy and quite productive.

Hart's Minnesota.—This variety has many good qualities, but is perhaps lacking in distinctive characteristics. The plants are healthy, vigorous, and fairly productive; fruit medium in size and of fair quality, but rather soft. There are doubtless too many varieties of this class that have no serious faults, yet lack in qualities that make them conspicuous.

Indiana.—Fall set plants bore a few berries of medium size. Judging from its behavior here it can hardly be classed among the promising sorts.

Jersey Queen.—Where extra fine berries are desired, this variety may be recommended. It is somewhat more productive than the Cumberland, but not enough so to make it profitable in all section. It is, perhaps, better suited for amateurs than for commercial growers.

James Vick—One-half of the berries on old plants did not mature. Upon young plants grown in hills the fruit was of medium size, firm, and of fair quality. Owing to the small size of the berries this variety will not give satisfaction if grown in matted rows. It will do somewhat better in hills, but there are so many better sorts that there is no use of retaining it longer.

Jewell.—Plants set in the fall of 1884 made a good growth, wintered well, and bore a fair crop. The plants are vigorous, healthy, and apparently quite productive. The berries are of large size, good color, quite firm, and of fair quality; sometimes irregular, but not unsightly. One season's trial is not enough to enable us to give a verdict concerning a variety, but the indications are that the Jewell is worthy of all the praise it has received.

Kentucky.—This well known variety is still a favorite in many sections. It is doubtful if any of the recently introduced sorts are likely to rival it for lateness, with the possible exception of the Ohio, which is mentioned in the proper place.

Lacon.—The plants are remarkably vigorous and productive, but showed some tendency to rust last season. The berries are soft and quite irregular, and are borne on short stems near the ground, making them difficult to pick. Although possessing many good qualities, this variety is not likely to become popular.

Miner's Prolific.—Although not new, this variety is not so well known as it ought to be. The plants are vigorous, healthy, and productive; fruit of good size, regular in shape, has a rich, glossy appearance, and is of excellent quality. For home use it stands at the head of the list. As a market sort it has two faults: First, the berries are rather soft, but are sufficiently firm to ship short distances; second, they do not always color well. There are no green

tips, as with some sorts, but the under side of the berries is often white, which necessitates care in picking and packing. The white part is not objectionable to the taste, being quite as sweet as the colored portion, but may deceive buyers. Where the Downing fails because of the rust the Miner may be planted to fill its place.

Mrs. Garfield.—No better report can be made of this sort than was given last year. The plants are not sufficiently vigorous and are quite unproductive. Reports concerning it from other sections are generally unfavorable.

Mt. Vernon.—Seems to be somewhat variable, doing well in some localities and in some seasons, but not in all. The plants grow well here but are unproductive.

Norman.—Doubtless deserves more favorable recognition than it has received. The plants are healthy, vigorous, and quite productive. Fruit above medium size, of good flavor, and fine appearance. For market it may not prove as profitable as some other sorts, but for home use it will be found to be desirable.

Night's Superb.—Unworthy of further trial.

Old Ironclad.—Conflicting reports are given concerning this variety, some growers giving it high praise, others condemning it as worthless. In 1884 it was unsatisfactory here but quite the reverse the past season. It probably can not be relied upon to give uniform results from season to season in any locality, although it may do better in some than in others. Its greatest fault seems to be overproductiveness, in consequence of which many of the berries are small and imperfect. In the fall of 1884 the plants bloomed quite freely, but the blossoms were all killed; in consequence the number of berries in 1885 was lessened but the crop was improved. Whatever may be said in favor of this variety, it must be classed as variable, hence not safe to plant in any quantity.

Ohio.—A variety soon to be introduced. It is a seedling of the Kentucky, which it resembles in habit of growth and appearance of its fruit, but the flowers are imperfect. The season is the same. The plants are perhaps rather more vigorous than those of the parent variety and much more productive. The foliage rusted slightly but not seriously. Probably this will take rank as one of the best late sorts.

Piper's Seedling.—Vigor of plants, abundance of bloom, and good size of fruit are qualities which this variety possesses in a marked degree, but yet it is unproductive. The promise of a bountiful crop at the beginning of the season is flattering but after two or three pickings the berries diminish in size rapidly and ripen quickly, thus the season is short and the yield light. This peculiarity was quite as marked in the past favorable season as in the previous dry one. The same complaint concerning this sort is feared from other sections, hence it cannot be recommended.

Prince of Berries.—Plants healthy and fairly vigorous, but quite unproductive here. Fruit ranks first class as to quality. For amateurs this is a desirable variety, but in most sections and under ordinary cultivation would not prove to be profitable for commercial growers.

Parry.—Plants set in the fall of 1884 grew finely, wintered well, and bore a good crop. The berries are large, firm, and of good quality. This is a promising variety and will undoubtedly take a high rank.

Photo.—This gave some of the finest berries that grew on the Station grounds. For amateurs it is a fine sort. The plants are not sufficiently vigorous and productive for general cultivation, while the berries color rather unevenly and do not keep well on the vines. The foliage is also somewhat inclined to rust.

Ray's Prolific.—Gave better results than in 1884. Some of the berries were

very fine. Plants lacks in vigor and productiveness, hence the variety is not to be recommended.

of the Cumberland, while the plants are quite as vigorous and much

Sucker State.—In size and appearance the berries are nearly equal to those more productive. This variety appears not to have received the attention that it deserves. Reports concerning it are favorable from nearly all sections and the indications are that growers would do well to plant it largely.

Sharpless.—This continues to be a favorite in some sections, but in others it is discarded. It should not be planted in localities subject to late spring frosts as the buds and blossoms are very tender. Unless grown with the best of care and under proper conditions the berries average but little larger than those of the Crescent, but when the conditions are favorable the berries are the largest and sell the highest of any that we offered in the market. This must be classed with the variable, uncertain varieties, and should be planted only where it is known to flourish.

Wilson.—This once popular variety is said by many to have run out, but the fact that it is still planted largely in many sections seems to be against the theory. The plants are considerably affected by the rust here and in many other sections where they flourished only a few years since, but they are not attacked as badly as many of the newer varieties. Probably the true explanation of the failure of the Wilson is that the rust is more prevalent than formerly. There is no doubt that it may still be grown with profit when the rust is not troublesome.

Wonderful.—Was sent out as a new variety last season, but it is unquestionably the Champion.

The following varieties were planted in the spring of 1885 and fall of 1884. Many of them have not been offered for sale. A few that were sent out in 1884 and appear in the list have not fruited sufficiently to warrant giving a report concerning them: Hathaway's, Nos. 3, 5, 8, 9, and 45, Foote's Seedling, Queen of the Peninsula, Mammoth Beauty, Dimondale, Gardener's Colossal, Kennedey's Seedling, Farnsworth, Connecticut Queen, Bancroft, Covill's Early, Garretson, Ontario, May King, Kruschkee's Nos. 1, 2, and 3, Amateur, Excelsior, Jessie, Bonanza, Crawford's No. 6, Henderson, Countess, Ellisdale, Parker Earle, Woodruff No. 1, Trowbridge, Bubach's No. 5, Lida, Sunapee, Montreuil, Royal Hautbois, Belle Bordelaise.

Some of the above are very promising, judging from the healthy foliage and the few berries that were allowed to mature.

Effects of Mulching.

The observations made in 1884, with thermometers placed over the bare ground and over straw, were repeated. The same general results were obtained. There can be little doubt that the temperature is lower and frost is more likely to occur where the ground is mulched than where it is left uncovered. This principle has long been known and applied in India. Pits are there dug and filled with straw to the depth of about two feet. Basins, filled with water, are placed on the straw in the evening, when the wind is from a northerly direction. The cold produced in this manner is sufficient to form ice when the conditions are favorable. It seems that the same principle holds good upon a field mulched with straw, although the cold produced is by no means as great as over greater depths of straw. The object of the observations was to ascertain if the increased danger from mulching was sufficient to warrant the removal of the material during the time of bloom.

The data obtained are insufficient to answer this question but the indications

are that the danger of frost is only slightly greater over mulched than over unmulched areas, and that only in exceptional cases would it pay to remove the mulch; nor would it be advisable to refrain from mulching because fears of frost are entertained. When the temperature is rising or stationary, the thermometer over bare ground often reads as low or lower than the one over straw. It is only when the temperature is falling that the one over straw records the lower temperature; such at least has been the fact thus far. This being the case, it is possible to obtain data that bear upon the question only when a frost is likely to occur. From the few observations that have been made it is not possible to deduce a law. The increased security from mulching, as a protection against drouth and winter-killing, would, probably in almost all cases, more than counterbalance the increased danger from frost caused by mulching. For the purpose of testing the value of mulch for winter protection, a strip through the middle of a large bed was left uncovered. The winter was unusually severe, killing nearly all the wheat in the neighborhood. The mulched portions of the bed wintered well and bore a good crop. The unprotected plants were seriously injured, and in consequence the crop on this portion of the bed was greatly lessened. As compared with the same varieties in other parts of the field, the following exhibit shows the loss sustained by not mulching. The mulched plants bore a full crop, but those unprotected yielded as follows: Sharpless, 25 to 50 per cent. of a full crop; Crescent, 75 per cent. of a full crop; Cumberland, 75 per cent. of a full crop; Downing, 50 to 75 per cent. of a full crop; Windsor Chief, 75 per cent. of a full crop.

Had this experiment been tried the previous season, the winter-killing would have been less, but the drouth would probably have occasioned nearly as great a shrinkage in the crop. The plan was tried of removing the mulch in the spring, and cultivating the ground lightly between the rows and then replacing the material, and found to be very advantageous where weeds were abundant, as they were much more easily subdued in this manner than by pulling or cutting off with a hoe. Further than this there was no marked advantage. Indeed, where the straw was removed and applied again after cultivation, the plants suffered more from drouth than where the mulch was undisturbed. Hence, it seems safe to conclude that where the soil is weedy, or where there is weed seed in the straw, it is advisable to practice spring cultivation, but if weeds are not abundant, the operation will not pay, and may, if dry weather follows, be attended with loss.

Cross-fertilization.

The experiments commenced in 1884, to determine the immediate influence of pollen, were carried on. Essentially the same method as described in the last report was followed. Some plants, kept over winter in a cold frame, were also used. Several varieties of imperfect flowering sorts were operated upon. In all cases the plants were protected from the wind and insects, and the pollen artificially applied. The difficulty of obtaining pollen in sufficient quantity was experienced at the beginning of the first season's work, hence some of the berries were imperfect, but it was soon found that the pollen was shed freely from the anthers a few hours after the flowers had been picked. No trouble was experienced in getting a plentiful supply of pollen last season, consequently, nearly all the berries were quite as perfect as those produced on exposed plants. Although, crosses were produced readily and satisfactorily, the results were far from being decisive. In some cases there was an apparent resemblance in the berries produced by crossing, to the berries of the variety from which pollen was used, but in many other instances no similarity could

be observed. The question is thus left open so far as our experiments are concerned. Experiments tried in other places the past season have not, so far as known, been conclusive.

None of the protected plants produced fruit unless pollen was artificially supplied to the flowers which corroborates former results, and shows that the conditions were perfect. It is possible that some imperfect flowering sorts may have sufficient pollen for self-fertilization if it be properly distributed by insects.

A neglected bed of Crescents, growing about fifteen rods from any other variety, bears more or less fruit, although so imperfect as not to be worth picking. The plants are among evergreen trees, and a raspberry plantation between it, and the other plantation, hence it is somewhat difficult for insects to fly from one direct to the other. The fruit is much more imperfect some seasons than others.

Some perfect flowering sorts bore fruit, although protected and undisturbed, hence we might reasonably expect Crescents and some others to do the same although bearing only a limited amount of pollen, but nothing of the kind has been observed where the experiment was properly conducted. It has not been possible to isolate plants in the open air so as to be perfectly sure that no pollen from other plants could reach them, through the agency of insects. It is doubtful if such an experiment would in any case be conclusive.

RASPBERRIES.

Nearly all the varieties named below were planted in 1883. Another planting of the same and many others was made in 1884. The season was somewhat peculiar, owing to which the table giving the time of blooming and ripening may need some revision. The unusually warm weather and abundant rains just before and at the time the fruit was ripening, shortened the season of fruiting, and caused the early and late sorts to mature more nearly at the same time than is usual. The late varieties were thus affected more than the early, hence the comparative times of ripening, as shown in the table, are not quite correct, as the late sorts are really later and have a longer season than that given. It is not probable, however, that the error in any case exceeds two or three days. The matter is unimportant, except for the reason that it is desirable to determine the comparative earliness of several varieties in order to settle some disputes that have arisen.

The weights and measurements are averages for the whole season, and are made up from notes taken at each picking.

The estimates of hardiness are made from two seasons' observations, both being unusually severe. In January, 1884, the thermometer registered 32 degrees below zero and 21 below in December of the same year. As the summer of 1884 was very dry, plants made a poor growth, and were consequently more injured by the cold of 21 degrees below zero than in the preceding winter when the mercury fell 11 degrees lower. It was noted that the winter killing was not so great in some parts of the field as in less severe winters. One part of a patch of Turners growing upon very rich, and not thoroughly drained soil has been injured every year since planted, but less in 1884 than in milder seasons. This shows that estimates of hardiness must take into account other conditions besides temperature. For this reason duplicate plantings are made even in the same field.

TABLE III.—RASPBERRIES—COMPARATIVE SIZE AND TIME OF RIPENING.

Name of variety.	Date of first bloom.	Date of first ripe fruit.	Weight of 100 berries.	Average diameter.
			Ounces.	Inch.
Cuthbert.....	June 6	July 6	5	11-16
Crimson Beauty.....	1	June 24	5	5-8
Davidson Thornless	May 30	25	.....	.....
Florence.....	June 1	30	.....	.....
Gregg.....	3	July 4	5½	3-4
Hansell	May 30	June 23	4½	11-16
Hopkins	30	30	4½	5-8
Highland Hardy	30	24	4	9-16
Lost Rubies.....	June 1	30	5½	11-16
Montclair	3	30	5½	5-8
Marlboro	3	30	5¾	3-4
Michigan Early Red.....	1	27	4	9-16
Ohio	1	30	4¼	3-4
Souhegan	May 28	24	4	9-16
Superb.....	June 3	30	5	11-16
Shaffer's Colossal.....	5	July 4	6	3-4
Turner.....	3	June 25	4½	5-8
Thwaek.....	3	July 1	4½	5-8
Tyler	May 28	June 24	4	9-16

NOTES ON VARIETIES.

Cuthbert.—Varying reports are heard concerning this variety. In some sections it appears to be satisfactory, while in others it is unproductive and not sufficiently hardy. It is undoubtedly variable and quite uncertain and must be tested for each locality. Where it does well it is without doubt one of the most valuable red sorts, but in such sections as this where extreme hardiness is a prime requisite it is unprofitable. Parties who think of planting the Cuthbert on a large scale should satisfy themselves as to its value in their locality before doing so.

Crimson Beauty.—Plants not entirely hardy, and only moderately productive. Fruit second quality, but beautiful in appearance, and is said to sell well in market. Reports are favorable from some sections, but not from all, hence cannot be recommended for general cultivation.

Florence.—A yellow variety, but of apparently little value.

Gregg.—Is still the leading black-cap, although there is much complaint as to its tenderness. Upon well drained soils it appears to be quite hardy, but does not rank quite as high as Tyler and Ohio in this respect. There is no well tried late variety to take its place. The Nemehak is said to be as late and much hardier, but has not been thoroughly tested.

Hansell.—One of the earliest of the reds, but generally found to be unproductive. The plants make only a moderate growth, and have not proved to be entirely hardy, although they have not been injured so much as those of *Crimson Beauty* and *Cuthbert*. The berries are of good size and color, and mature quickly, making the season quite short. In this respect it may be considered earlier than the *Turner*, although the first ripe berries appear on each at about the same time. The *Hansell* crop is soon ripe and gone, while that of the *Turner* lasts longer and is much larger. Even when the pickings from the *Hansell* are at their best the yield is no larger than from the *Turner* at the same time, hence the *Turner* is quite as valuable as the *Hansell* as an early sort, and yields a large crop after the *Hansell* is done bearing.

Hopkins.—This second early black-cap seems to have been neglected. The plants are quite vigorous, hardy and productive, while the fruit is of fair size and of good color and quality. Reports concerning it are generally favorable, and it may be safely planted where a medium early sort is wanted.

Highland Beauty.—Was planted for comparison merely, being no longer desirable, as it is superseded by better sorts.

Lost Rubies.—Under the name of *Naomi* this variety was once favorably known. The plants are quite hardy and productive, but the fruit is quite soft and crumbles badly, hence does not sell well in market. In quality, however, it is excellent, and is very superior for canning purposes. There are many better varieties, and it is for that reason discarded by nearly all growers.

Montclair.—Plant vigorous, hardy and productive. Fruit large, good quality, soft, dark and rather dull in color. But little notice seems to have been taken of this sort, although it possesses more good qualities than the majority of those that have been so vigorously pushed into notice. For market the color of the fruit and its softness are objectionable, but for home use the *Montclair* is the peer of any of the reds variety.

Marlboro.—This variety appears to sustain the reputation given it at the outset. The plants are hardy, healthy and productive. The fruit is large, firm and beautiful in appearance. By some it is rated as good in quality, while other class it as medium. Although there are red sorts that are as good or better for home use it is already ranked by most good judges as a very valuable market variety.

Michigan Early Red.—Although quite early, this variety has no qualities to recommend it for general cultivation.

Ohio.—Much has been claimed for this variety of late, and the probability is that it has not been rated too high. The plants are vigorous, hardy and productive. One of the most desirable of the early black-caps.

Reliance.—Gives satisfaction in some sections, where it is reported to be the most profitable of all red sorts, but from other places the reports concerning it are unfavorable.

Superb.—Not sufficiently hardy. Fruit soft and of dark, dingy color. There are so many better red sorts that the *Superb* may be dropped from the list without loss.

Shaffer's Colossal.—No red variety has received more disinterested and deserved praise than this. The plants are vigorous and wonderfully productive, while the fruit is considered to be unequalled for canning purposes. For home use there is probably no other variety so desirable. It seems to do well almost everywhere, and the fact that the plants do not sprout from the root is a great advantage to private growers. The fruit being of an objectionable color and quite soft would seem to render it unmarketable, but examples are numerous where it has sold at the highest prices when customers became aware of its ex-

cellent quality. Shaffer's Colossal stands pre-eminently at the head of the list for private growers and is fast taking a high rank as a profitable market variety.

Souhegan and *Tyler*.—These are distinct varieties, or at least had a different origin, but are so nearly identical that there is no longer any use of both names. The fruit of the *Souhegan* is possibly somewhat more glossy than that of the *Tyler*, while the plants of the latter are perhaps rather more vigorous in growth than those of the former. This variety, whichever name may be adopted, is fast coming into prominence because of its earliness, hardiness, and productiveness. Good reports concerning it come from almost every section, so that there can no longer be any doubt of its value for general cultivation.

Thwack.—Although possessing many good qualities, is superseded by better varieties.

Turner.—Plants very hardy and productive. Fruit of good quality but only medium in size and quite soft. In spite of its faults this variety still ranks as one of the most profitable reds. To secure good results the sprouts should not be allowed to grow too thickly. The best plan is hill culture, setting the plants five feet apart each way and allow only three or four canes to grow in each hill. This method insures good crops while the fruit is much improved in size and firmness. Grown in this manner the *Turner* is a very profitable variety, but when grown in the hedge-row system the fruit is small and soft and almost worthless for market.

The following varieties are on trial: Carman, Hilborn, Nemaha, Rancocas, Meredith Queen, Shaffer's Sister, Kagy's Everbearing, Key's Prolific, Palmer's Seedling, Springfield, Caroline, Golden Queen, Silver Queen, Chapman, Baumforth's Seedling.

BLACKBERRIES.

The following varieties have been planted: Early Cluster, Early Harvest, Brunton's Early, Snyder, Taylor, Stone's Hardy, Wilson, Jr., Wallace, Staymen's Early, Minnewaski.

Snyder and Stone's Hardy were the only varieties that passed through the winter uninjured. Taylor plants were partially killed. Minnewaski was not planted until the spring of 1885, hence no statement can be made as to its hardiness; except that has, however, withstood a cold of 12° below zero the past winter, unharmed.

A variety of blackberry that is as hardy as the Snyder, with fruit as large as that of the Lawton or Kittatinny is greatly needed at present. Several varieties that are said to answer that description have been promised for trial.

EXPERIMENTS WITH GARDEN VEGETABLES.

The work with vegetables during the past season was mainly a continuation and extension of that mentioned in previous reports. Some progress has been made in the determination of synonyms, but many doubtful cases remain for further study. The difficulties are increased from the fact that stocks of any given variety from different sources are often very diverse in character, even when comparatively pure. It is scarcely possible in many instances to do more than group similar forms, and either recognize them as varieties or as strains of one variety. Cases occur where the divergence of a particular strain is very slight, and yet practically it is of much greater value than less closely allied strains. Very often it is not possible to define the difference between two strains in botanical terms, although one may be valuable and the other comparatively worthless; hence it is evident that if the work is to have a practical bearing something more is to be done than to note botanical distinctions. Impure stock is also the cause of much annoyance and perplexity, and it is impossible in many cases to determine the relations of alleged varieties because of the diversity of forms that appear.

For much of the confusion that now exists in vegetable nomenclature, no one in particular is to blame. Many varieties are known under numerous names that are easily recognized as slight variations of the original name. This partly arises from carelessness in writing the names, and partly from a desire to make them descriptive, as Early Round Blood Turnip Beet. Such names are objectionable because of their length, and are often quite inappropriate. The practice that some seedsmen have of prefixing their names to varieties is sometimes defended on the ground that they are thus obliged to look more carefully after the growing of their stock. The fact that quite as good, and in many cases better stock can be obtained from dealers who do not resort to the practice, is sufficient to show that it has no significance.

The renaming of old varieties, whether of foreign or domestic origin, by a dealer prefixing his name, and calling it his "Earliest" or "Best", is nothing less than an effort to deceive the public, and is a reprehensible practice. Doubtless such cases will be the last to yield to reform.

Much might be accomplished, however, if seedsmen would agree upon a uniform method of writing names of varieties. The word Egyptian would serve as well for the name of an early beet, as Extra Early Egyptian Blood Turnip, or any other of the variations in use. Such a course would greatly simplify matters, and harm no one. In the notes on varieties a distinction is made between known and probable synonyms. The latter are usually spoken of as having marked resemblances. Notes were taken on each variety planted, as to purity, uniformity, trueness to type, etc. The name of the seedsman from whom the seed was procured is given in each case, because such a course is necessary in order to make the notes intelligible and useful. This part of the work is not undertaken merely for the purpose of investigating the quality of stock sold by different seedsmen but rather for the purpose of showing the importance of *selection*. The necessity of great care in growing seeds is not fully realized by the public; nor is the value of good stock fully appreciated. If this work could be extended so as to include stock from all the principal seed dealers and growers, and trials be made in several sections of the country, the results could not fail to be of great value to seed buyers, and might also do much to put the seed trade on a better basis, by showing the risk attending the use of *cheap seeds*, and the economy of buying only the best.

Trials of varieties must of necessity be comparative, hence old sorts are retained to serve as standards by which to judge the merits of the new. The soil upon which the vegetables were grown was not in sufficiently good condition to give large yields, but since all varieties were treated alike the comparisons hold good.

All classes of vegetables have not been grown for want of means and suitable soil. Seed was procured direct from the seedsmen, but hereafter it will be procured both directly and indirectly.

BEETS—EARLY.

Twenty-one varieties of early beet seed were sown May 5. Seed of some varieties was obtained from several sources for the purpose of comparing the quality of stock. An attempt was made to determine comparative earliness of varieties, but owing to difference in quality of stock the result was unsatisfactory. Sixty-four days from the time of sowing, the beets, two inches or more in diameter, were counted in each row.

The greatest number was found in the row of Crosby's Egyptian, seed of which was procured from J. J. H. Gregory. Eclipse from A. W. Livingston's Sons, and Bastian's Extra Early from Peter Henderson & Co., were next in earliness, while Landreth's Very Early, Bassano and Egyptian from D. Landreth & Sons ranked third. Egyptian from A. W. Livingston's Sons, and Eclipse from W. Atlee Burpee & Co., took the fourth place with Blood Turnip. Doubtless there is very little difference in the earliness of the varieties named, and another trial might give quite contradictory results. There was a marked contrast in quality of stock, which is particularly mentioned in the notes on varieties.

Notes on Varieties.

Bassano. (D. Landreth & Sons.) A well known popular variety. A strong grower, requiring more room than the seort-topped sorts. Stock good, showing but little variation.

Bassano. (A. W. Livingston's Sons.) Stock shows careful selection.

Bastian's Extra Early. (Peter Henderson & Co.) Not as vigorous in growth as Bassano; beets similar in shape, but the skin and flesh are darker in color. A very desirable variety. Stock pure. Probably the same as Philadelphia Early.

Bastian's Extra Early Red Turnip. (W. Atlee Burpee & Co.) Same as Bastian's Extra Early. Stock impure, shows a mixture of Bassano.

Dewing's Improved Blood Turnip. (Peter Henderson & Co.) A very good strain of Blood Turnip. Perhaps a few days latter than the Egyptian.

Burpee's Improved Blood and *Burpee's Early Turnip*, from W. Atlee Burpee & Co., appear to be identical with the above, but the stock was so badly mixed as to make identification impossible.

Maule's Blood Turnip (Benson, Maule & Co.) and *Wilson's Early Blood Turnip* (Samuel Wilson) are identical with Dewing's Improved Blood Turnip. Stock comparatively pure.

Crosby's Early Egyptian. (J. J. H. Gregory.) The same as Egyptian, but is an improved strain. The beets are thicker and somewhat more regular in shape than the ordinary Egyptian.

Egyptian. (A. W. Livingston's Sons.) Stock quite pure.

Egyptian Extra Early Turnip. (D. Landreth & Sons.) Same as the above. Stock not quite pure, showing a small percentage of Bassano.

Eclipse. A. W. Livingston's Sons.) About as early as the Egyptian, and perhaps superior to that variety. The beets are more nearly globular and of

better color. Stock shows a slight mixture, and a tendency to revert to inferior forms.

Eclipse. (W. Atlee Burpee & Co.) Same as the above. The Eclipse is spoken of in the Fourth Annual Report of the New York Experiment Station as follows: "The Eclipse Turnip (Henderson) was very different in some respects from the same of Gregory, being much larger in size and less regular in form." It is probable that the Eclipse has not been brought up to the highest possible perfection. Different stocks of it seem to vary considerably which indicates that selection has not been carried far enough.

Landreth's Very Early. (D. Landreth & Son.) Resembles the Bassano in shape of root, but the tops are shorter, while the flesh has a larger percentage of red. Quite desirable. Stock pure.

Omega. (Isaac Tillinghast.) Resembles the Pine Apple; probably identical.

Pine Apple. (Henderson.) The roots are rather longer and not so thick as Bastain's Extra Early, but similar in color. Perhaps a few days later than the other early sorts. Thought by some to be of superior quality, but the shape is objectionable for market purposes.

Philadelphia Perfection. (Johnson & Stokes.) Resembles Bastain's Extra Early, but is rather stronger in growth and later. Quite desirable; good stock.

Philadelphia Early. (D. Landreth & Sons.) Very poor stock. Apparently Bastain's Extra Early, and Landreth's Extra Early mixed.

CABBAGE—EARLY.

Seed of early cabbage was sown March 23. The plants were transplanted April 18, and set in the field May 12. The growth was rapid and healthy from the start. Care was taken to select plants of as near a uniform size as possible of each variety. About fifty plants of each sample were used, thus making it possible to determine with considerable accuracy percentage of variation. The first cutting of each variety was made as soon as five or more heads were ready. The last cutting was made when the latest heads were fit for market. Single heads of some sorts were fit to cut before the date given, but the time of maturity of the first head is not given, because such data are often very misleading, and the more so with varieties that are not uniform.

The notes given at the right of the table are perhaps sufficiently explanatory. It may be remarked, however, that Early Wakefield is the most reliable for first early, Early Summer for second early. Low's Peerless is a very promising sort. Chase's Excelsior, Early Deep Head and Fottler's Brunswick are the best next in succession. Early Etampes, Early Advance, Premier, Johnson & Stokes' Earliest, and Landreth's Earliest are quite early but are unreliable, forming very few solid heads. The difference in stock from various sources is worthy of note.

TABLE IV.—EARLY CABBAGE.

Name of variety.	Date of first cutting.	Date of last cutting.	Weight of largest head.		Average weight of heads.		Average circumference of heads.		Remarks.
			<i>lbs.</i>	<i>oz.</i>	<i>lbs.</i>	<i>oz.</i>	<i>ins.</i>		
Bloomsdale Early Market—D. Landreth & Son.....	Aug. 1	Aug. 14	4	9	3	10	21		Heads usually conical, solid. A reliable variety; resembles Large Wakfield, but is rather better.
Berkshire Beauty—I. Tillinghast—Puget Sound seed	"	"	3	8	2	14	23		Heads quite solid, but show some tendency to rot.
Berkshire Beauty—Benson, Maule & Co.....	"	"	2	14	2	11	22		Same.
Chase's Excelsior—A. W. Livingston's Sons.....	"	"	6	6	4	3	24		Stock good; shows careful selection; very sure to head; heads solid; formed heavier heads in 1884.
Drumhead St. John's Day—Vilmorin, Andrieux & Co	July 13	July 23	5	6	3	4	24		Heads quite solid, but are very apt to crack open; variable as to earliness. Not so desirable as Wakfield.
Early Advance—W. Atlee, Burpee & Co.....	"	"	1	11	"	"	20		Resembles Early Etampes; heads loose. Poor stock; badly mixed.
Early Dwarf Flat Dutch—D. Landreth & Sons.....	Aug. 1	Aug. 14	5	1	3	5	24		Heads quite solid. Good stock; shows but little variation.
Early Flat Dutch—D. Landreth & Sons	"	"	5	2	2	14	22		Leaves have a silvery appearance; quite distinct.
Early Flat Dutch—Benson, Maule & Co.....	"	"	3	11	3	11	22		Good stock.
Early Flat Dutch—Peter Henderson & Co.....	"	"	4	10	3	8	23		Shows little variation.
Early Etampes—Vilmorin, Andrieux & Co.....	July 13	July 23	4	"	2	12	20		Heads rather loose. But little variation from type.
Early Etampes—Johnson & Stokes	"	"	3	5	2	8	20		Same.
Early Etampes—D. M. Ferry & Co.....	"	"	3	6	2	9	19		Same.
Early Etampes—J. J. H. Gregory.....	"	"	3	3	2	7	20		Not as good stock as the other lots; showed considerable variation.

TABLE IV.—Continued.

Name of variety.	Date of first cutting.	Date of last cutting.	Weight of largest head.		Weight of smallest head.		Average circumference of heads.	Remarks.
			lbs.	oz.	lbs.	oz.		
Early Etampes—Benson, Maule & Co.....	July 13	July 23	4	...	2	7	21	Good stock; even, true.
Early Etampes—Francis Brill	" 13	" 23	4	6	2	12	21	True; very little variation.
Early Drumhead—Francis Brill	Aug. 1	Aug. 14	5	5	3	7	24	Heads quite solid. Good stock.
Early Beighfield Giant—D. Landreth & Sons	" 1	" 14	4	10	3	...	21	Same.
Early Beighfield Giant, P.S.—Isaac Tillinghast...	" 1	" 14	3	4	2	10	20	Same.
Early Beighfield Giant—Benson, Maule & Co.....	" 1	" 14	5	13	4	5	24	Heads solid. Well selected; shows but little variation.
Early Deep Head—J. J. H. Gregory	" 1	" 14	6	1	4	10	28	Heads solid. Resemble Large Wakefield in shape.
Early Wyman—J. J. H. Gregory	" 1	" 14	5	11	3	13	21	Good stock; very even, true. All solid heads. A very poor variety.
Early Winningstadt—A. W. Livingston's Sons	" 1	" 14	5	8	3	...	19	Extra good stock; shows almost no variation; apparently, has been selected with great care.
Early Dwarf York—James Vick	July 13	July 23	2	1	1	8	16	Only 20 per cent. true; 80 per cent. a mixture of late varieties. Some not fit to cut until Aug. 19; many of the plants formed no heads at all.
Early Wakefield—Francis Brill	" 10	" 23	4	...	3	12	21	Quite true; good stock.
Early Wakefield—W. Atlee, Burpee & Co.....	" 13	.....	3	14	..	..	.....	Quite good stock; a few doubtful forms. Stock not pure; shows a considerable percentage of Early Summer and later sorts. Contains a slight percentage of Early Summer or some later form, but otherwise very good stock.
Early Wakefield—Benson, Maule & Co	" 13	July 23	3	13	2	8	20	Good stock; although not quite pure, contains nothing undesirable.
Early Wakefield—D. M. Ferry & Co.....	" 10	" 23	5	14	3	...	22	
Early Wakefield—J. J. H. Gregory	" 13	" 23	4	5	2	13	20	
Early Wakefield—Joseph Harris	" 13	" 23	5	5	2	5	21	
Early Wakefield—Peter Henderson & Co	" 13	" 23	3	12	2	11	20	

Early Wakefield—Johnson & Stokes.....	"	13	"	23	3	14	3	2	21	Very true, even, good stock; shows but little variation.
Early Wakefield—A. W. Livingston's Sons.....	"	13	"	24	3	5	2	10	20	Fairly good stock; shows some variation, but not enough to be injurious.
Early Wakefield—D. Landreth & Sons.....	"	13	"	23	3	1	2	8	20	Extra good stock; very pure and true to type.
Early Wakefield, P. S.—Isaac Tillinghast	"	23	Aug. 14	5	8	3	5		23	Rather later than most other strains of Wakefield, but in other respects quite as good. Resembles the Late Wakefield greatly.
Early Wakefield—James Vick.....	"	10	July	23	3	2	2	8	19	Extra good stock; shows careful selection.
Early Wakefield—Samuel Wilson.....	"	13	"	23	2	13	2	5	20	Good stock.
Early Wakefield, large—D. Landreth & Sons.....	Aug. 1		Aug. 14	4	10	3	9		22	Very even; shows little variation.
Early Wakefield, large—Francis Brill.....	July	23	"	14	5	3	6		22	Same.
Early Summer—W. Atlee, Burpee & Co.....										Not true; considerably later than E. Summer.
Early Summer—Francis Brill	July	23	Aug. 14	4	8	3	5		24	Very uniform.
Early Summer—Benson, Maula & Co	"	23	"	14	4	4	8		25	Quite good; a few of a later variety.
Early Summer—D. M. Ferry & Co.....	"	23	"	14	4	8	3	6	23	Good stock; shows but little variation.
Early Summer—J. J. H. Gregory.....	"	23	"	14	4	9	3		24	Same.
Early Summer—Joseph Harris	"	23	"	14	5	14	3	6	24	Same.
Early Summer—Peter Henderson & Co	"	23	"	14	4	4	3	2	24	Same.
Early Summer—Johnson & Stokes.....	"	23	"	14	5	4	3	10	25	Apparently the same as Landreth's Early Summer.
Early Summer—A. W. Livingston's Sons	"	23	"	14	5	3	4		24	A few heads of a later variety, but on the whole good.
Early Summer Flat Head—D. Landreth & Sons ...	"	23	"	14	3	12	2	10	23	Rather shorter stemmed than Henderson's. Leaves yellowish green. Shows need of more careful selection.
Early Summer, P. S.—Isaac Tillinghast.....	"	23	"	14	7	4	4	7	27	Quite true, even, very carefully selected stock.
Early Summer—James Vick.....	"	23	"	14	5	14	4	4	25	Good stock, although somewhat later on the average than some strains.
Early Summer—Samuel Wilson	"	23	"	14	4		2	6	.....	Resembles Landreth's Early Summer.
Fottler's Improved Brunswick—Isaac Tillinghast..	Aug. 14				6	1	4	6	28	A very desirable variety. Good stock.
Johnson & Stokes' Earliest—Johnson & Stokes	July 13		July	23	3	14	2	4	20	Resembles Early Etampes, although perhaps not identical. Heads loose and light.
Landreth's Earliest—D. Landreth & Sons	"	13	"	23	4	4	3	5	22	Of the Etampes type, but extremely variable in form and earliness. Heads usually soft. Quite unreliable.
Low's Peerless—J. J. H. Gregory.....	Aug. 1		Aug. 14	6	13	3	8		.....	Probably a form of Early Flat Dutch, but a very excellent strain; very uniform.
Premier—Peter Henderson & Co	July 13		July	23	2	3	1	10	18	Resembles Paris Market. Heads loose and soft. Unreliable here.

CABBAGE—LATE.

Seed of late cabbage was sown May 15 and the plants set in the field June 25. About seventy five plants of each variety and strain were planted. The plants of each variety were divided into two lots. One lot was planted on the Station grounds and the other lot was sent to Loder E. Green, of Medina county. Thus the trial was duplicated throughout, with the exception of a few sorts. Plants sent to Medina county gave uniformly better results than were obtained with those at the Station. This was probably due to richer soil and more favorable climatic conditions.

In making up the table the average was obtained by combining the results from both localities. The percentage of the heads formed is also the average of both. The heaviest weight given is in every case, except two, that obtained in Medina county. Some sorts, seeds of which were obtained from Europe, failed in both localities, as did also several obtained from American seedsmen. The percentage of heads formed may seem to be quite low in most cases, but marketable heads only were counted. These percentages, in connection with the notes, will give a better clue to the value of any variety than will the weight of heads.

TABLE V.—LATE CABBAGE.

Name of variety.	Heaviest head.		Average weight of heads.		Per cent. plants that formed solid heads.	Remarks.
	Lbs.	oz.	Lbs.	oz.		
Drumhead, Short Stem—Samuel Wilson.....	7	8	3	8	21	Failed here; record given is for northern Ohio. Very even; fine stock.
Drumhead, Late American—Isaac Tillinghast	9	3	5	9	68	Short stemmed; very fine stock.
Drumhead, Royal German—Johnson & Stokes	9	4	5	12	72	Heads mostly loose; stock rather uneven.
Drumhead, Premium—D. M. Ferry & Co	6	14	3	12	41	Short stemmed; very even, good stock.
Drumhead, Short Stem—W. Atlee, Burpee & Co	8	6	6	5	67	Good stock; heads very solid.
Drumhead, Bridgeport—A. W. Livingston's Sons	10	8	6	8	60	Short stemmed; very even, fine stock.
Drumhead, Improved—Francis Brill.....	11	12	6	15	69	Good stock, although many heads were soft.
Drumhead, Sonemason—Francis Brill.....	8	00	4	6	40	Heads rather loose; stock even.
Drumhead, Silver Leaf—Francis Brill.....	6	2	5	7	53	Short stemmed, very uniform; heads solid. A very desirable variety.
Drumhead, Louisville—Francis Brill	8	8	6	5	74	A good variety, but perhaps not so reliable as the above. Heads solid but variable in size.
Drumhead, Short Stem—Francis Brill	10	00	5	14	45	Heads soft; this variety seldom does well here. Apparently somewhat variable; not suited to this locality.
Drumhead, Marblehead Mammoth—Peter Henderson & Co.....	8	6	6	4	69	Heads rather loose.
Flat Dutch, Prize—Benson, Maule & Co.....	4	9	2	11	33	Very uniform and true to type, but was considerably affected by the heat. Was much better in northern Ohio than here.
Flat Dutch, Pale Green—Francis Brill.....	6	8	5	00	50	Not so uniform as the above, but perhaps better for this section.
Flat Dutch, Excelsior—Francis Brill.....	9	00	5	6	70	Good stock, although it shows a little variation. Shows some tendency to rot. Heads quite loose.
Flat Dutch, Premium—Francis Brill.....	10	00	6	12	65	Quite variable, showing both long and short stemmed types.
Flat Dutch, Bristol—Francis Brill.....	9	8	6	12	70	Somewhat variable; both long and short stemmed.
Flat Dutch, Superior—W. Atlee, Burpee & Co.....	9	10	4	8	30	Same.
Flat Dutch, Excelsior—Isaac Tillinghast.....	6	4	4	00	53	
Flat Dutch, Premium—J. J. H. Gregory	8	12	5	15	64	
Flat Dutch, Premium—Samuel Wilson	5	12	4	9	56	

TABLE V.—Continued.

Name of variety.	Heaviest head.		Average weight of heads.		Per cent. plants that formed solid heads.	Remarks.
	Lbs.	oz.	Lbs.	oz.		
Flat Dutch, Selected—Peter Henderson & Co.....	10	8	6	00	66	Very uniform and true. Did not, however, give as good result as last season.
Flat Dutch, Premium—Peter Henderson & Co.....	12	8	6	7	73	Mostly of the long stemmed type, but quite uniform. Apparently a very desirable sort for this section.
Flat Dutch, Premium—Johnston & Stokes.....	7	12	5	15	40	Mostly long stemmed; quite uniform and good.
Flat Dutch, Premium—A. W. Livingston's Sons.....	9	8	5	9	88	Long stemmed; quite uniform; reliable strain.
Flat Dutch, Premium—Hiram Sibley & Co.....	9	00	6	00	50	Mostly long stem, but rather uneven.
Flat Dutch, Large—Hiram Sibley & Co.....	8	00	5	6	47	Similar to the above.
Flat Dutch, Premium—Joseph Harris.....	7	4	5	6	29	Mostly long stemmed; rather uneven.
Flat Dutch, Excelsior—Joseph Harris.....	7	8	4	6	55	Short stemmed. Affected considerably by heat. No heads formed.
Flat Dutch, Large—James Vick.....	.....	.....	.....	.....	.....	Short stem, quite uniform.
Flat Dutch, Excelsior—James Vick.....	8	00	4	5	42	Long stem, somewhat variable.
Flat Dutch, Premium—James Vick.....	7	13	5	14	53	Mostly long stemmed type, somewhat variable.
Flat Dutch, Premium, P. S.—Isaac Tillinghast.....	6	12	5	3	75	Short stem. Affected considerably by the heat.
Flat Dutch, Excelsior, P. S.—Isaac Tillinghast.....	6	00	4	3	33	Quite uniform, but heads rather soft.
Flat Dutch, Premium, E. G.—Isaac Tillinghast.....	9	8	5	15	60	Long stemmed. Rather uneven.
Flat Dutch, Premium—D. M. Ferry & Co.....	5	8	3	15	50	Long stemmed, but very uniform. A very reliable variety.
Flat Dutch, Bloomsdale—D. Landreth & Sons.....	7	4	5	6	87	Did not mature properly.
Large Late Mountain—D. Landreth & Sons.....	5	8	4	8	32	Quite uniform. A reliable variety.
Surehead—W. Atlee, Burpee & Co.....	7	8	4	15	57	Same.
Surehead—Johnston & Stokes.....	8	10	5	9	70	Same.
Surehead—Benson, Maule & Co.....	7	8	5	00	47	Same.
Surehead—Francis Brill.....	10	8	6	4	54	Same.
Surehead—Samuel Wilson.....	8	12	5	5	77	Same.
Savoy, Drumhead Perfection—Francis Brill.....	4	8	3	00	68	Uniform, good. The Savoy usually give very poor results here.
Savoy, Drumhead—A. W. Livingston's Sons.....	7	00	4	00	30	Same.

The following varieties from American seedsmen failed to form heads: Dwarf Ulm Savoy, D. M. Ferry & Co.; Golden Savoy, Johnson & Stokes; Pomerain or Filder, James Vick; Green Glazed, Peter Henderson & Co.; Drumhead, Large Red, Francis Brill; Large Flat Dutch, James Vick. Marblehead Mammoth Drumhead, from no seedsmen, gave good results. Chase's Excelsior nearly failed as a late sort, as did also several strains of Fottler's Brunswick. Premium Flat Dutch was better in most cases than Excelsior Flat Dutch, although the distinction between them is not well marked, at least not as shown by the samples received under these names.

CARROTS.

Carrot seed was sown May 7, in rows eighteen inches apart. The plants were thinned to three inches apart in the row. Doubtless a better development of root would have been obtained had more space been allowed. The conditions were, however, the same for each variety so far as known.

The yield of sixteen feet of row is given, although that alone is not enough for comparison. The remarks made concerning each variety, and the character of stock from each seedsmen, together with the yields will aid any one in making selections for particular purposes. The Long Orange is, perhaps, the best of all if productiveness alone is considered, but the length of root is objectionable. Danvers and Geurande yield nearly as heavily, and are much easier to dig. The Geurande, especially, is worthy of all the praise it has received.

TABLE VI.—CARROTS.

Name of variety.	Weight of roots from 16 feet of row.	Remarks.
	<i>lbs. oz.</i>	
Carentan Early, Half Long (Vilmorin, Audrieux & Co.).....	9 13	Half long, often stump rooted, very even, true.
Danvers (Peter Henderson & Co.).....	13 10	Half long, regular, smooth, good stock, pure and true. Perhaps the best variety for general purposes.
Danvers (D. M. Ferry & Co.).....	14 14	Extra good stock.
Danvers (James Vick).....	13 00	Pure, true to type.
Danvers (D. Landreth & Sons)...	12 3	Considerably mixed with a white variety; roots uneven and rough.
Dutch Horn, Early Short Stump Rooted (Vilmorin, Audrieux & Co.).....	8 1	Very short, regular, even. Adapted to forcing, but not suitable for field culture.
English Horn (Vilmorin, Audrieux & Co.).....	8 00	Half long irregular and poor.
Early Very Short Scarlet (James Vick).....	9 8	Almost turnip shape, regular; even in size; good stock. Useful only for forcing.
Early Scarlet Horn Blunt Rooted (D. Landreth & Sons)...	8 1	Similar to preceding, probably identical.
Early Half Long, Stump Rooted (Vilmorin, Audrieux & Co.)...	11 15	Half long, similar in shape to Danvers, but not so desirable.
Extra Early Forcing (D. Landreth & Sons).....	10 13	Similar to French Horn.
Early French Short Horn (James Vick).....	14 2	Probably identical with French Horn.

TABLE VI.—Continued.

Name of variety.	Weight of roots from 16 feet of row.		Remarks.
	lbs.	oz.	
Early Scarlet Horn (D. M. Ferry & Co.)	13	9	Similar to the preceding.
French Horn Early Short Fencing (Vilmorin, Andrieux & Co.)	12	7	Very short, almost turnip shape; good stock.
Geurande (D. M. Ferry & Co.)	15	10	Very short, stump rooted; regular; even in size; good stock.
Geurande (J. H. Gregory)	14	14	Not quite as good stock as the preceding. A very desirable variety.
Half Long Stumped Rooted (James Vick)	9	1	Probably identical with Early Half Long Stump Rooted.
Half Long Luc (Vilmorin, Andrieux & Co.)	15	6	Similar to Danvers, but of smaller diameter.
Harris Half Long (Joseph Harris)	13	15	Much like Danvers. Roots vary considerably in size and shape.
Large White Belgian (D. Landreth & Sons)	13	12	Quite long, smooth, regular; good stock. A good variety.
Long White Belgian Green Top (James Vick)	14	12	Probably the same as above, although usually longer.
Long White Green Top (Vilmorin, Andrieux & Co.)	13	6	Very long and slender. Not desirable.
Large Short White Vosges (Vilmorin, Andrieux & Co.)	8	10	Quite short, almost turnip shape; quite smooth and regular.
Long Orange (James Vick)	15	6	Probably the best of the long sorts; yields heavily. Smooth regular, good stock.
Long Orange (D. Landreth & Sons)	19	11	Very smooth and regular. Good stock carefully selected.
Long Red St. Valery (Vilmorin, Andrieux & Co.)	11	9	Smaller than the preceding. No so desirable.
Long Scarlet Altringham (Vilmorin, Andrieux & Co.)	3	8	Long, slender, very rough and poor.
Long Red, without core (Vilmorin, Andrieux & Co.)	9	8	Slender, rough and irregular.
Long Red Surry (Vilmorin, Andrieux & Co.)	9	5	Very irregular and rough.
Nantes Early Half Long (Vilmorin, Andrieux Co.)	9	7	Half long, tapering very little. Apparently unproductive.
New Half Long (D. Landreth & Sons)	14	11	Resembles Danvers, but rather shorter. May be desirable if distinct.

CORN, SWEET.

Sweet corn was planted June 6.

Table VII gives the time of edible maturity, height of stalk and length of ear of each variety, at least approximately. It is not possible to secure in every instance uniform strains of varieties, nor can the same variety be kept pure from year to year, hence comparisons in different seasons may give quite contradictory results. Strains of the same variety may vary in earliness a week or more, and in other respects quite as much. Had seed been procured from several sources the results might have been more satisfactory. The table will, however, serve as a guide in the selection of varieties for a succession.

Especial attention is called to Ford's Early Sweet as a very desirable early sort. It is nearly as early as the Marblehead, and much superior in quality. The Golden Sweet excels all others tested as to quality. It cannot be praised too highly as a variety for home use. As a second early for market, Livingston's Early Evergreen is unexcelled.

TABLE VII.—SWEET CORN.

Name of variety.	Edible. Aug.	Average length of ear. <i>Inches.</i>	Average height of stalk. <i>Fect.</i>	Remarks.
Amber Cream	20	7	6	Quality good.
Adam's Extra Early	10	5	4	Quality very poor. Valuable only for earliness.
Bonanza	15	7	5	Very similar to E. Minn., probably identical, at least not superior to
Grosby's Extra Early	15	6½	5	Quality medium.
Cory	10	6	4	Resembles E. Marblehead. Superior to that var. in appearance of ear.
Egyptian	24	7½	7	A standard sort.
Early Orange	15	6	5	Quality very good.
Early Minnesota	12	5	3½	Quality medium. Resembles Tom Thumb.
Early Concord	15	7	5	Generally considered to be a standard sort.
Ford's Early Sweet	20	6	6	Quality good.
Ford's Improved Mammoth	12	6	5	Quality good, better than Marblehead.
Golden Sweet	24	7½	6½	Quality good.
Hickox	20	6	5½	Quality ex. good. One of the very best for home use, but not desirable
Livingston's Early Evergreen	24	7	6	for market.
New Triumph	20	7	7	Quality good. A very desirable second early var. especially valuable
New Pee & Kay	20	6½	6½	Quality good.
Perry's Hybrid	15	6	6	Quality good. Very desirable for second early.
Potter's Excelsior	15	6	5	Resembles Early Orange, probably identical.
Rose's Improved Evergreen	20	7½	6½	Quality excellent.
Red Cob Evergreen	18	7	7	Quality good.
Stowell's Evergreen	24	7	7	Quality very good.
Sugar Corn	24	7½	7½	Quality excellent.
Tom Thumb	15	5	4	Quality poor.
White Marblehead	10	6	4	Quality medium. A standard early sort.

CELERY.

The trial of varieties resulted unsatisfactorily, owing to unsuitable soil and unfavorable conditions. A method of growing celery was tried which appears to be especially useful in dry seasons, and upon soils not well adapted to the crop naturally. It is simply a modification of the trench system. The trenches, or beds, are made about four feet wide and as long as desirable. The soil should be excavated to the depth of one foot and about six inches of surface soil, well mixed with fine manure, returned to the trench. If the surface soil is a foot or more in depth it is unnecessary to excavate more than six inches of the surface, and spade in a liberal supply of well rotted manure in the bottom of the trench. In this trench the plants should be set in rows, 12 to 14 inches apart, crosswise of the bed, and six inches apart in the rows. Where water is available irrigation should be practiced. The soil thrown out of the bottom of the trench serves for earthing up, or tile may be used. After earthing up is completed the bed may be covered with straw and the celery kept until very severe freezing occurs. For family gardens this method is particularly applicable, as but little space is required to grow a supply. If the bed is conveniently located near the pump, it can be easily irrigated as often as desirable.

ONIONS.

All of the work with onions, except thick and thin seeding, was duplicated in Medina county by Loder E. Green. The yields in that locality were uniformly larger than at the Station. At the Station three series of plots were sown, while the series were duplicated in Medina county, thus each series was repeated five times. The plots were the one-thousandth of an acre in size. In the tables the yield is given per acre, as calculated, being more convenient for reference and comparison.

Table VIII. is a comparison of stock from different seedsmen. It will be noted that there was a wide range in yield. This was undoubtedly due to the character of the stock, as the result corresponds with previous trials, and the individual plots, in most cases, agreed very closely with the averages given in the table. The late ripening strains gave larger yields in all cases, except one, while the average yields of the late plots are considerably higher than the average of the early ripening plots. There were rather more scullions in the late than in the early ripening strains, but the difference was not marked. Yellow Danvers was the variety used.

TABLE VIII.—ONIONS, COMPARISON OF STOCK.

From whom purchased.	Date of ripening.	Calculated yield per acre.	Remarks.
		<i>Pounds.</i>	
Benson, Maule & Co	Sept. 7	13,563	Fair stock, a few red.
W. Atlee, Burpee & Co....	7	13,625	A few red, fair stock.
D. M. Ferry & Co.....	1	16,875	Pure, good stock.
J. L. Green.....	11	18,825	Extra good stock.
J. J. H. Gregory.....	Aug. 28	12,500	Good stock.

TABLE VIII.—Continued.

From whom purchased.	Date of ripening.	Calculated yield per acre.	Remarks.
		<i>Pounds.</i>	
Peter Henderson & Co ...	Sept. 11	16,312	Good stock.
Joseph Harris.....	11	14,250	First class stock.
A. W. Livingstons' Sons.	11	16,000	Quite good stock, a few red onions.
Hiram Sibley & Co.....	Aug. 28	12,500	Quite good stock, a few white onions.
W. W. Rawson & Co.....	Sept. 11	12,935	Pure and true.
Isaac Tillinghast.....	Aug. 28	13,687	Good stock.
James Vick.....	Sept. 11	13,935	True and fine.
Samuel Wilson	1	9,688	Fairly good stock, a few white onions.
Johnson & Stokes	Aug. 28	12,125	Good stock.

Table IX. gives the yields of fertilized plots for both localities. These yields are given separately, as the soil in Medina county was more fertile and gave larger yields than were obtained at the Station. It responded less readily to fertilizers, however, giving in most instances a smaller percentage of gain, but the yield of plots was less uniform. There was a marked uniformity in the yield of the plots at the Station. In both localities a number of plots were left unfertilized. The average of these plots was taken and used as a basis of comparison with fertilized plots. The last column shows the gain or loss in the use of the fertilizer. In most cases the gain is so slight that it might be attributable to other causes than the use of the fertilizer. Where a loss occurs it is doubtless due to unknown causes, rather than to the harmful effect of the fertilizer, except in the cases of wood ashes and salt. The diminished yield where these substances were used can hardly be accounted for, except on the supposition that they were actually harmful. Salt was apparently beneficial in small quantities, but as might be expected, it was deleterious where more than 1,000 pounds per acre were used. Horse manure did not give as good results as might have been expected, nor is the showing for any fertilizer very satisfactory.

TABLE IX.—ONIONS, YIELDS OF FERTILIZED PLOTS.

Fertilizer used.	Locality.	Yield per acre in pounds.	Gain or loss, as compared with the average of unfertilized plots. + or -.
Bowker's special onion manure, 500 lbs. per acre.....	Station	22,662	+1,412
	Medina county.....	36,250	+5,750
Bowker's special onion manure, 1,000 lbs. per acre.....	Station	24,662	+3,412
	Medina county.....	28,500	-2,000

TABLE IX.—Continued.

Fertilizer used.	Locality.	Yield per acre, in pounds.	Gain or loss, as compared with the average of unfertilized plots. + or -.
Bowker's special onion manure, 1,500 lbs. { per acre.....	Station Medina county....	23,562 34,250	+2,312 +3,750
Bowker's special onion manure, 2,000 lbs. { per acre.....	Station Medina county....	24,935 31,812	+3,685 +1,312
Baker's special onion manure, 500 lbs. { per acre.....	Station Medina county....	23,750 40,000	+2,500 +9,500
Baker's special onion manure, 1,000 lbs. { per acre.....	Station Medina county....	24,000 28,500	+2,750 -2,000
Baker's special onion manure, 1,500 lbs. { per acre.....	Station Medina county....	24,125 33,500	+2,875 +3,000
Baker's special onion manure, 2,000 lbs. { per acre.....	Station Medina county....	25,187 31,500	+3,937 +1,000
Wood ashes, unleached, 30 bushels per { acre	Station Medina county....	18,687 35,000	-2,563 +4,500
Wood ashes, unleached, 90 bushels per { acre	Station Medina county....	18,000 27,000	-3,250 -3,500
Wood ashes, unleached, 90 bushels per { acre	Station Medina county....	18,875 28,000	-2,375 -2,500
Wood ashes, unleached, 120 bushels per { acre	Station Medina county....	19,625 23,000	-1,625 -7,500
Hen manure, 30 bushels per acre..... {	Station Medina county....	22,687 33,000	+1,437 +2,500
Hen manure, 60 bushels per acre..... {	Station Medina county....	21,187 28,000	- 63 -2,500
Hen manure, 90 bushels per acre..... {	Station Medina county....	23,112 31,000	+1,862 + 500
Hen manure, 120 bushels per acre..... {	Station Medina county....	21,687 33,000	+ 437 +2,500
Horse manure, well rotted, 5,000 lbs. per { acre	Station Medina county....	21,687 34,000	+ 437 +3,500
Horse manure, well rotted, 10,000 lbs. { per acre.....	Station Medina county....	22,625 28,000	+1,375 -2,500
Horse manure, well rotted, 20,000 lbs. { per acre.....	Station Medina county....	22,750 40,000	+1,500 +9,500

TABLE IX.—Continued.

Fertilizer used.	Locality.	Yield per acre, in pounds.	Gain or loss, as compared with the average of unfertilized plots. + or —.
Agricultural salt, 250 lbs. per acre.....	Station	21,375	+ 125
Agricultural salt, 500 lbs. per acre.....	Station	24,750	+3,500
Agricultural salt, 750 lbs. per acre.....	Station	27,000	+5,750
Agricultural salt, 1,000 lbs. per acre	Station	25,625	+4,375
Agricultural salt, 1,500 lbs. per acre	Station	17,435	—3,815
Agricultural salt, 2,000 lbs. per acre	Station	14,187	—7,063

Thick and Thin Seeding.

Seed of Yellow Danvers was sown thickly and when the plants were large enough thinned to one, two, three, and four inches apart in the row. The results, which are the averages of three series of plots, are given in Table X. But few of the onions were marketable, grown upon the plots where the plants were thinned to one inch apart. Upon very rich soil and in favorable seasons the result might be different. Ordinarily, one and one-half to two inches are perhaps about the proper distances to secure the largest crops of marketable onions.

Distance apart in the row.	Yield per acre —in pounds. Calculated.
One inch	24,250
Two inches	21,819
Three inches	19,630
Four inches	10,630

PEAS.

Peas were sown May 2d, in drills three feet apart. The seed was placed three inches apart in the row and covered with three inches of soil. The work was conducted upon the same plan as that of the previous season. Nearly all of the same varieties were retained and a number of new and some old ones added to the list. The season was very favorable, especially in the earlier part, hence the record of nearly all of the early varieties was uncom-

monly good. The Early Philadelphia and closely allied strains, under various names, continued much longer in bearing than is usual. The vines from which pickings were made continued in bearing for some time after plants in the same rows, from which no peas were picked, were dead. The last pickings, however, were quite poor, as the pods were not well filled.

Table XI. is designed to show the comparative earliness of varieties named. It does not show the first mature pods found upon the plants of any variety, but shows how many pods were fit to pick at a given date. The first picking was made in every case before any of the peas were too hard to use, and all the pods mature enough to pick at that time were taken. In fact, the pickings were made just as though the peas were intended for market or table use. This method shows just what it is desirable to know about any variety, viz.: the length of season and time of largest picking. According to this method, the earliest variety is the one that shows the greatest number of pods at the first picking and yields its crop in the shortest time. The season being less favorable for the late than the early sorts, the former do not make as good a showing, comparatively, as the latter.

The length of season, or number of days in bearing, given, is undoubtedly too long for some of the early sorts and too short for some of the late, but the length of season seems to be quite variable with most varieties and is influenced greatly by the weather, depth of planting, and time of planting.

Before the picking was commenced twenty five plants were counted off in each row, and the same plants picked from each time.

TABLE XI.—PEAS, COMPARATIVE EARLINESS.

Name of variety.	First picking—days from planting.	No. of pods from 25 plants.				No. of days in bearing.
		First picking.	Second picking.	Third picking.	Fourth picking.	
American Wonder (A. W. Livingston's Sons)...	53	30	43	40	22	18
Andes (O. H. Alexander)	60	180	150	40	.....	14
Buss' Abundance (Peter Henderson & Co.).....	70	372	206	.....	.....	10
Biiss' Everbearing (Peter Henderson & Co.).....	70	199	212	.....	.....	10
Carter's Premium Gem (J. J. H. Gregory) ...	53	53	83	39	59	18
Cleveland's Rural New Yorker (Rural N. Y.)..	50	63	29	44	24	20
Champion of England (A. W. Livingston's Sons).	70	260	250	.....	.....	10
Dwarf Champion of England (J. J. H. Gregory).	70	268	222	.....	.....	10
Dwarf Marrowfat (A. W. Livingston's Sons)....	70	222	285	.....	.....	10
Early Daniel O'Rourke (W. W. Rawson & Co.).	50	61	22	24	21	20
Extra Early (J. A. Evritt)	50	52	36	37	48	20
Extra Early (Benson, Maule & Co.).....	50	71	30	25	17	20
Extra Early (D. M. Feary & Co.).....	50	63	31	35	9	20
Extra Early (W. Atlee, Burpee & Co.)	59	105	106	231	78	21
Extra Early (James Vick)	50	63	21	6	25	20
Extra Early Philadelphia (Hiram Sibley & Co.	50	50	50	31	12	18
Express (J. J. H. Gregory)	50	60	31	24	30	20
Early Pearl (O. H. Alexander).....	50	90	33	7	15	20
Excelsior (C. L. Allen)	50	63	41	52	16	20
First in the Market (A. W. Livingston's Sons).	50	63	23	76	26	20

TABLE XI.—Continued.

Name of variety.	First picking—days from planting.	No. of pods from 25 plants.				No. of days in bearing.
		First picking.	Second picking.	Third picking.	Fourth picking.	
First and Best (D. M. Ferry & Co.).....	50	59	24	56	40	20
First and Best (Hiram Sibley & Co.).....	50	62	24	33	22	20
First of All (Peter Henderson & Co.).....	50	60	32	28	18	20
Family Garden (Benson Maule & Co.)	70	435	66	.....	.....	10
Garden Pride (J. C. Everitt).....	53	116	35	25	50	20
Horsford's Market Garden (Horsford & Pringle)	60	31	67	230	248	20
Cross Imperial and Champion (Horsford & Pringle)	70	334	231	.....	.....	10
Hoskin's Vermont Wonder (O. H. Alexander)	53	52	84	29	28	18
Improved Stratagem (O. H. Alexander)	70	150	359	.....	.....	10
Kentish Invicta (D. Landreth & Sons).....	53	110	60	.....	.....	8
Landreth's Extra Early (D. Landreth & Sons)...	50	55	26	47	25	20
McLean's Little Gem (A. W. Livingston's Sons)	53	22	59	74	150	18
McLean's Advancer (A. W. Livingston's Sons).	53	20	55	62	114	18
Maud 8 (J. J. H. Gregory).....	50	67	35	28	21	20
Marrowfat (A. W. Livingston's Sons)	70	173	204	.....	.....	10
No. 3 Cross of American Wonder and Sunrise (O. H. Alexander).....	53	46	81	31	44	18
New Atlantic (O. H. Alexander).....	60	24	257	187	.....	14
No. 10 (O. H. Alexander).....	70	117	141	.....	.....	10
New Pride of the Market (Benson Maule & Co.)	70	218	81	.....	.....	10
Pride of the Market (W. Atlee Burpee & Co.).	70	214	192	.....	.....	10
Prince of Wales (Rural New Yorker).....	70	394	168	.....	.....	10
Perpetual .....	.....	.....	.....	.....	.....	.....
Rival (C. L. Allen)	70	272	226	.....	.....	10
17th of June (W. W. Rawson & Co.)	50	63	31	29	31	20
Stratagem (D. Landreth & Sons)	70	169	80	.....	.....	10
Stratagem (Rural New Yorker).....	70	150	107	.....	.....	10
Stratagem (A. W. Livingston's Sons).....	70	144	98	.....	.....	10
Similax (O. H. Alexander)	70	204	338	.....	.....	10
Tom Thumb (D. M. Ferry & Co.).....	53	67	62	17	15	18
Telephone (A. W. Livingston's Sons).....	70	173	53	.....	.....	10
Telephone (D. Landreth & Sons).....	70	216	71	.....	.....	10
Wicks' New Dwarf (O. H. Alexander).....	53	62	67	38	36	18
Wm. Hurst (J. J. H. Gregory).....	53	48	86	19	6	18
Yorkshire Hero (W. W. Rawson & Co.).....	70	403	138	.....	.....	10

In Table XII. is given the whole number of pods picked from twenty-five vines, also the number of peas. These numbers do not agree very closely with those given in the last report, being larger in most cases, the exceptions being the early sorts. The same remark applies to the weight of pods and of shelled peas. The relative weight of pods and shelled peas appears, however, to be nearly the same for the two seasons.

It will be seen that the relative weight of shelled peas is much smaller in

the smooth than in the wrinkled sorts, being 15 to 20 per cent. greater in the latter than in the former, the only exceptions being the early wrinkled sorts; but even they stand higher than the smooth varieties. In some of the late sorts the shelled peas weigh more than the empty pods, but in some of the smooth early sorts the weight of empty pods is more than twice that of the shelled peas.

TABLE XII.—PEAS. COMPARATIVE PRODUCTIVENESS.

Name of variety.	Number of pods from 25 plants.	Number of peas from 25 plants.	Weight of pods in ounces.	Weight of peas in ounces.	Average number of peas per pod.
American Wonder (A. W. Livingston's Sons)	137	739	23 $\frac{3}{8}$	91	5+
Andes (O. H. Alexander)	370	1,302	50	22 $\frac{3}{8}$	3+
Bliss' Abundance (Peter Henderson & Co.)	578	1,934	73 $\frac{1}{2}$	36	3+
Bliss' Everbearing (Peter Henderson & Co.)	411	1,419	62	30 $\frac{3}{8}$	3+
Carter's Premium Gem (J. J. H. Gregory)	234	1,025	31 $\frac{1}{2}$	13	4+
Cleveland's Rural New Yorker (Rural New Yorker)	160	814	24 $\frac{1}{2}$	9 $\frac{1}{2}$	5+
Dwarf Champion of England (J. J. H. Gregory)	490	1,511	77 $\frac{1}{2}$	37	3+
Dwarf Marrowfat (A. W. Livingston's Sons)	507	1,933	61 $\frac{1}{2}$	31 $\frac{1}{2}$	4—
Early Daniel O'Rourke (W. W. Rawson & Co.)	128	583	18 $\frac{3}{8}$	6	4+
Extra Early (J. A. Everitt)	174	854	26 $\frac{3}{8}$	9 $\frac{3}{8}$	5—
Extra Early (Benson Maule & Co.)	143	722	21 $\frac{1}{2}$	8	5+
Extra Early (D. M. Ferry & Co.)	138	656	20 $\frac{1}{2}$	7	5—
Extra Early (W. Atlee, Burpee & Co.)	520	2,875	66 $\frac{1}{2}$	31	5+
Extra Early (James Vick)	115	475	13 $\frac{3}{8}$	6	4+
Extra Early Philadelphia (Hiram Sibley & Co.)	143	664	20 $\frac{3}{8}$	8	4+
Express (J. J. H. Gregory)	145	667	21 $\frac{1}{2}$	6	4+
Early Pearl (O. H. Alexander)	145	634	20 $\frac{1}{2}$	7	4+
Excelsior (C. L. Allen)	172	920	29 $\frac{1}{2}$	11 $\frac{1}{2}$	5+
First in the Market (A. W. Livingston's Sons)	188	995	32 $\frac{1}{2}$	11	5+
First and Best (D. M. Ferry & Co.)	179	941	29	10 $\frac{1}{2}$	5+
First and Best (Hiram Sibley & Co.)	141	669	19 $\frac{3}{8}$	7	5—
First of All (Peter Henderson & Co.)	138	652	20 $\frac{3}{8}$	7	5—
Family Garden (Benson Maule & Co.)	501	2,466	61 $\frac{3}{8}$	30	4+
Garden Pride (J. A. Everitt)	226	955	27 $\frac{3}{8}$	10	4+
Horsford's Market Garden (Horsford & Pringle)	576	2,376	72 $\frac{1}{2}$	35 $\frac{1}{2}$	4+
Cross Imperial and Champion (Horsford & Pringle)	565	1,956	97 $\frac{1}{2}$	44	3+
Hoskins' Vermont Wonder (O. H. Alexander)	193	849	30 $\frac{1}{2}$	11	4+
Improved Stratagem (O. H. Alexander)	509	2,085	108	44	4+
Kentish Invicta (D. Landreth & Sons)	170	790	21 $\frac{1}{2}$	9	4+
Landreth's Extra Early (D. Landreth & Sons)	183	792	25 $\frac{3}{8}$	8 $\frac{3}{8}$	5+
McLean's Little Gem (A. W. Livingston's Sons)	305	2,022	53 $\frac{3}{8}$	29 $\frac{1}{2}$	6+
McLean's Advancer (A. W. Livingston's Sons)	251	1,373	42 $\frac{3}{8}$	17	5+
Maud S (J. J. H. Gregory)	151	708	22 $\frac{3}{8}$	8 $\frac{1}{2}$	5+
Marrowfat (A. W. Livingston's Sons)	377	1,844	58 $\frac{1}{2}$	30 $\frac{1}{2}$	5—
No. 3 Cross of American Wonder and Sunrise (O. H. Alexander)	202	971	34 $\frac{3}{8}$	13 $\frac{3}{8}$	5—
New Atlantic (O. H. Alexander)	468	2,008	64	32	4+
No. 10 (O. H. Alexander)	258	1,259	72 $\frac{1}{2}$	27	5—
New Pride of the Market (Benson Maule & Co.)	299	1,633	78 $\frac{1}{2}$	30 $\frac{1}{2}$	5+
Pride of the Market (W. Atlee, Burpee & Co.)	406	1,986	95	36	4+
Prince of Wales (Rural New Yorker)	562	1,648	84	39 $\frac{1}{2}$	3—
Rival (C. L. Allen)	622	2,386	91 $\frac{3}{8}$	44	3+
Seventeenth of June (W. W. Rawson & Co.)	154	714	22 $\frac{3}{8}$	8 $\frac{3}{8}$	5+
Stratagem (Rural New Yorker)	357	1,583	82	35 $\frac{3}{8}$	4+
Stratagem (D. Landreth & Sons)	301	1,422	75 $\frac{1}{2}$	32 $\frac{1}{2}$	4+

TABLE XII.—Continued.

Name of variety.	Number of pods from 25 plants.	Number of peas from 25 plants.	Weight of pods in ounces.	Weight of peas in ounces.	Average number of peas per pod.
Stratagem (A. W. Livingston's Sons).....	242	1,365	73½	30½	5+
Smilax (O. H. Alexander).....	542	2,854	82½	43½	4+
Tom Thumb (D. M. Ferry & Co.).....	161	785	19½	7	5—
Telephone (A. W. Livingston's Sons).....	226	1,193	61½	27½	5+
Telephone (D. Landreth & Sons).....	287	1,394	77½	32½	5—
Vick's New Dwarf (O. H. Alexander).....	203	796	30½	11½	4—
Wm. Hust (J. J. H. Gregory).....	159	799	26½	8½	5+
Yorkshire Hero (W. W. Rawson & Co.).....	541	1,911	88	45	3+

Remarks on Varieties.

Of the early sorts, Cleveland's Rural New Yorker, Everitt's, Maule's, Ferry's and Vick's Extra Earlys, Ferry's and Sibley's First and Best, Henderson's First of All, Livingston's First in the Market, Early Pearl, Early Philadelphia, Excelsior, Landreth's Extra Early, and 17th of June, are essentially the same. Some of them may have been grown with greater care than others, but all of those named are good stock, showing careful selection, and all that is claimed for them as to earliness, is true, except that no one of them is the earliest pea in existence, unless it is conceded they are all strains of one variety, in which case the claim may be allowed. The record given shows some slight differences as to earliness and productiveness, but it is by no means certain that another trial would give the same results. Burpee's Extra Early was quite different from the others, being taller, more productive, but nine days later. It was the same as a variety under the erroneous name of Early Philadelphia from the same source.

Stratagem sustains its reputation, and Alexander's Improved Stratagem seems really to be an improvement, so far as productiveness is concerned.

Vick's New Dwarf is promising, and may prove to be superior to American Wonder.

Bliss' Abundance is an excellent variety, but Bliss' Everbearing is a misnomer. It is only fairly productive, and yields its crop at two pickings.

For a variety that continues long in bearing and yields heavily, Horsford's Market Garden seems to have no superior. It is unrivaled for family use.

Smilax is very promising, also Early Pearl, if upon further trial it should prove to be as early as it appears to be.

RADISHES.

Radish seed was sown May 16. Owing to the favorable season the crop was excellent. As will be seen by referring to the table the time to marketable maturity is given, but most sorts were edible three or four days earlier. For first early, Olive Rose and New French Breakfast are as good as any. The best varieties on the list for general purpose are Peckert's Improved Charters and White Lady Finger. They excel not only in handsome appearance, but in tenderness, crispness and in length of season, and are nearly as early as any.

Name of variety.	Marketable.—No. of days from planting.	Remarks.
Becker's Improved Chartiers—A. W. Livingston's Sons....	27	A fine showy variety, of good quality; remains good a long time before becoming pithy; excellent for summer use.
Early Prussian Globe—D. Landreth & Sons.....	25	Resembles Olive Rose, but perhaps rather better; becomes pithy very soon.
Early Long Scarlet Short Top—A. W. Livingston's Sons ...	27	A well known sort, but doubtless superseded by better kinds.
Early Scarlet Turnip—A. W. Livingston's Sons.....	25	Very tender at first, but remains good only a short time; same as Round Deep Scarlet Turnip.
Early White Turnip—A. W. Livingston's Sons.....	25	Very small; not desirable.
Earliest Scarlet Erturt—A. W. Livingston's Sons.....	22	Remains good only a short time; desirable only for earliness.
Early Deep Scarlet Turnip—D. Landreth & Sons.....	25	Soon becomes pithy.
Earliest Short Top White Rooted—D. Landreth & Sons....	25	Much like Early White Turnip, but rather more dwarf in habit.
Dayton White—A. W. Livingston's Sons.....	30	Very inferior; threw up flower stalks almost as soon as edible.
Grey Summer—A. W. Livingston's Sons.....	30	Mixed with a purple sort.
Giant Stuttgart—A. W. Livingston's Sons.....	40	Quite mild; a good late sort.
Golden Globe—A. W. Livingston's Sons.....	31	A good summer sort, but apparently the same as Yellow Summer.
Long White Naples—A. W. Livingston's Sons.....	30	Rather tough, and often ill-shaped.
Market Gardener's Early Long Scarlet—D. Landreth & Sons	27	Apparently the same as Wood's Early Frame.
Mammoth Summer—A. W. Livingston's Sons.....	30	Threw up flower stalks as soon as edible; very inferior.
New French Breakfast—A. W. Livingston's Sons.....	25	A good early sort, but becomes pithy soon.
Olive Rose—A. W. Livingston's Sons.....	25	Remains good only a short time, but very tender at first.
Round Deep Scarlet Turnip—A. W. Livingston's Sons....	25	The same as Early Scarlet Turnip.
White Tipped Scarlet Turnip—A. W. Livingston's Sons....	25	Very pretty, tender, but soon becomes pithy.
White Tipped Scarlet—D. Landreth & Sons.....	25	Same as the above.
White Lady Finger—D. Landreth & Sons.....	27	Very beautiful, clear white, tender, crisp; an excellent variety.
Wood's Early Frame—A. W. Livingston's Sons.....	27	An excellent long rooted sort.
Yellow Summer—A. W. Livingston's Sons.....	30	Excellent for summer use; remains edible a long time.

TOMATOES.

Seed was sown in the hot bed April 20. The plants were once transplanted and set in the field June 2. The tomato is quite variable as to earliness; the variety that is earliest one season may not be so the next. If the order of ripening, as given in Table XIII., and that given in Table IX. of the last report are compared, there will be found to be much diversity. Perhaps the method pursued in this report of giving the number of ripe fruits found at the time of each picking is less objectionable than that of merely giving the date of the first ripe fruit, but it is very doubtful if any method whatever can be pursued that will give anything more than an approximation. With none but well established varieties, brought to a high degree of fixity and uniformity by selection, it is possible to determine earliness. Most of the so-called varieties of tomatoes are merely strains that have not become fixed by thorough selection, hence it is impossible to affirm anything whatever concerning them. It will be seen that Acme seed taken from the first ripe fruit, produced plants that gave fruit earlier than that taken from the last ripe fruit. Doubtless, the plan of saving seed from the first good fruit, or from plants that give the most early fruit, is a good one. It has been observed that the finest, if not the earliest fruit is secured by this method of selection. There was no difference observed between seed saved from fruit affected by rot, and that saved from sound fruit. Seed saved from green fruit failed to germinate.

TABLE XIII.—TOMATOES.

Name of variety.	First ripe fruit.	Number ripe August 14.	Number ripe August 21.	Number ripe August 31.	Average weight in ounces.	Average circumference in inches.
Acme—Seed from first ripe fruit.....	Aug. 3	26	27	53	5	8½
Acme—Extra selected.....	3	17	17	42	5	8½
Acme—Seed from last ripe fruit.....	10	5	16	22	4½	8½
Acme—D. Landreth & Sons.....	11	17	16	28	5	8
Alpha—Frank Ford & Son.....	2	37	49	39	3½	7½
Advance—Frank Ford & Son.....	3	26	24	74	3½	7½
Canada Victor—J. J. H. Gregory.....	6	30	8	44	4	7½
Climax—W. Atlee, Burpee & Co.....	8	14	7	23	5	8½
Challenge.....	12	3	3	9	6	9
Cardinal—Peter Henderson & Co.....	10	5	3	6	5	8
Essex Hybrid—Peter Henderson & Co.....	10	12	11	12	5	7½
Early Richmond—D. Landreth & Sons.....	5	32	15	26	4¾	8½
Favorite—A. W. Livingston's Sons.....	12	17	10	12	6	9
Golden Queen—A. W. Livingston's Sons...	10	11	6	17	6	9
Mayflower—Peter Henderson & Co.....	10	12	5	12	5	8
Market Champion—Johnson & Stokes.....	10	11	2	12	5	8
Optimus—D. M. Ferry & Co.....	10	24	17	20	5	7½
Paragon—A. W. Livingston's Sons.....	10	11	10	23	5	8
Perfection—A. W. Livingston's Sons.....	8	11	7	7	5½	8
Perfection—Seed from first ripe fruit.....	3	8	12	28	5½	8
Perfection—Seed from last ripe fruit.....	6	13	6	12	5	7
Precursor—Benson, Maule & Co.....	8	11	7	13	4½	8
Queen—Peter Henderson & Co.....	4	6	9	25	5	8½

TABLE XIII.—Continued.

Name of variety.	First ripe fruit.	Number ripe August 14.	Number ripe August 21.	Number ripe August 31.	Average weight in ounces.	Average circumference in inches.
Rochester—Hiram Sibley & Co	12	5	2	8	6	10
Standard Market and Shipping—J. A. Everett.....	8	24	9	14	5	8½
New Tree Tomato—Johnson & Stokes.....	21	.....	.....	.....	.....	.....
Golden Trophy—D. Landreth & Sons.....	10	14	12	29	6	9
Trophy—D. Landreth & Sons.....	12	9	9	20	6	9
Wonder of Italy	12	7	10	47	2	5

Notes on Varieties.

Advance.—Rather larger and not so rough as the Alpha, but not large and smooth enough to become a profitable market variety. It may be profitable in some sections, but in this market the fruit could not be sold at any price as soon as the large fruited sorts ripen.

Climax.—A fine, smooth fruited variety, much resembling the Favorite.

Challenge.—Fruit large and irregular. Has no especial merits.

Cardinal.—Fruit of good form and color, but rots quite as badly as the Acme. Not superior to that variety, except for markets where its color is in its favor.

Market Champion.—Resembles the Cardinal, and whether identical or not, is a fine variety or strain.

Mayflower.—Fruit often irregular. Has not come up to the promises made for it.

Optimus.—Fruit quite smooth, resembling the Perfection in color. It may be identical with that variety, but is hardly superior to it.

Precursor.—Fruit quite irregular. Scarcely better than Canada Victor.

Queen.—Quite irregular. Fruit mostly unsalable.

Rochester.—Fruit quite large, but somewhat irregular, and ripens unevenly.

Standard Market and Shipping.—Quite regular and smooth, but resembles the Perfection.

New Tree Tomato.—Identical with the Upright Red. Fruit too rough and late.

Wonder of Italy.—Fruit small and worthless.

SEED TESTS.

BY W. S. DEVOL.

The testing of the vitality of seeds was done as near as it was possible during the season of planting, (excluding tests given in Table II.), beginning February 24th, and ending August 10th. The plan of conducting the germinations at this time was adopted that any differences in vitality that might arise from the time of year and age of seed might be eliminated, and the comparison of tests thereby made as just as it is possible to make it.

The total number of germinations made in the period intervening between the above mentioned dates was 887, as follows: Corn sent to the Station for testing, 290 samples; varieties of field corn used in field experiments from specimen ears sent to the Station, 82 tests; varieties of sweet corn used in field experiments, 40 tests; garden seeds, and a few miscellaneous seeds, 505 tests.

All the tests were made in the germinator described in our first annual report. The temperature for the germination of corn was 82° to 92° Fahrenheit. For other seeds it was kept between 78° and 85° Fahrenheit.

SEED CORN.

Corn harvested in 1884 was housed in better condition than it had been for two or three years before, and withstood the cold of the winter better, coming out at seeding time mostly uninjured. Better care, too, was taken in curing and keeping seed corn than formerly, as evinced by the remarks accompanying seed sent to the Station for testing.

Two hundred and sixty tests of seed corn were made during the spring of 1885, for persons in all parts of Ohio, and a few from without the State. These tests are given in detail in Table I.

In the first column in the left is the number of test as recorded at the Station. Following this in order are given: the name of the variety of corn; the color of the grain, "Y" yellow, "W" white, "R" red, "S" striped or spotted; the name and address of the person sending the corn; the number of hours from the time the test was begun until the first kernel was observed to have sprouted; the number of days from the time the sample was put in the tester until the last seed to germinate had done so; the per cent. of seed that germinated; the number of ears from which the sample was taken; the place on the ears from which the kernels were taken; and remarks concerning the manner in which the corn had been cured and kept.

An average of over 95 per cent. germinated of the samples taken from that which had been thoroughly dried by being spread thinly upon a floor, placed on shelves, ricked up, hung up by the husks, or some such manner, while of the samples taken from the crib, an average of but a little over 90 per cent. germinated. This is equivalent to the saving of over 5 per cent. of the seed in planting, besides, what is of much more importance, the greater certainty of the

corn being evenly distributed over the field when it comes up, for the poorer the seeds the more variable will be the number of stalks in a hill.

The difference in the vitality of the seed due to different ways of curing and keeping the corn may be made evident by selecting a few examples from the table.

Take samples of Leaming corn, Nos. 1487-9, left in the shock in the field until February, at which time it was tested. The average germination from the three tests, from the tips, middles and butts of the same fifty ears, was 81.3 per cent., and from the middle of the ear, which represents the greater part of it, only 72 per cent. The three succeeding tests (Nos. 1490-2), made at the same time, are of the same variety, grown near the above, but properly cured in October. An average of 98.7 per cent. germinated, and 100 per cent. from the middle of the ear, a difference of 28 per cent. from the middle of the ear. Compare Nos. 1469-71 with Nos. 1472-4. The treatment of both lots was the same until it was cribbed in the fall, when the corn from which the three first named tests were made, was spread thinly in a loft at the same time as that from which the last named tests were made was put in the crib. In these there was a difference of 20 per cent. in the germinations from the middle of the ears.

It is evident to any one who has given the matter attention, that we do not as a rule, in curing, storing and keeping our seed corn, take the care necessary to insure the best germination, even when planted under the most favorable circumstances. Nor will this care be given until we are convinced that it will pay to do so. Is it good economy to take the time and trouble necessary to select, thoroughly dry and properly store the corn that is to be used for seed? In 1884 over 2,600,000 acres were planted to corn in Ohio. Assuming five quarts of seed to have been required per acre to plant this, it required over 400,000 bushels of seed corn. From the table of germinations it was found that over 5 per cent. more of corn that was properly cured germinated than that simply kept in cribs. In other words it would require over 5 per cent. more of seed from the crib than of the cured seed to get the required number of stalks on a given area of ground. It would therefore require over 20,000 bushels more for seed, than if it *were all properly cured*, and at the average market price of corn for the year, cost over \$9,000. But an average of 5 per cent. difference in vitality required the planting of not only the 5 per cent. of extra seed to insure the proper number of stalks, but much more, say another 5 per cent. to insure the proper distribution of the stalks. This will raise the cost of seed to \$18,000. But seed corn sells for more than the average price of corn, often four and five times the price. Suppose that on an average it was twice as high, the extra cost of seed is thus seen to be \$36,000 per year in Ohio alone.

But this not all. It is, indeed, but a small part of the expense caused by poor or inferior seed. The cost of replanting, the delay occasioned by this often resulting in an entire failure of the crop, the expense of thinning where too many kernels had been planted to insure enough stalks in the hill, and the poor corn thrown upon the market from uneven ripening and mixing caused by replanting makes the cost to the farmers of the State far more than at first appears. Compared with the cost from neglecting to do so, the expense of properly curing and storing the necessary amount of corn for seed, is quite insignificant.

SEED TESTS.—TABLE I.—SEED CORN SENT TO THE STATION FOR TESTING, 1885.

Test number.	Variety.	Color of grain.	Tested for —	First seed sprouted— hours.	Last seed sprouted— days.	Total seed sprouted— per cent.	Number of ears seed taken from.	Place on the ear.	Remarks.
1460	Big Yellow	Y	A. T. Millard, Springboro.....	21	2	98	100	T	Hung up in October in a warm room.
1461	"	Y	same.....	21	2	99	100	M	
1462	"	Y	same.....	21	3	100	100	B	
1463	"	Y	same.....	21	2	99	100	T	Ricked up in November in a warm room.
1464	"	Y	same.....	21	2	99	100	T	
1465	"	Y	same.....	21	3	95	100	M	
1466	Yellow Dent.....	Y	F. Beneke, West Alexandria.....	21	3	98	100	T	Selected in November and kept dry.
1467	"	Y	same.....	21	2	98	100	M	
1468	"	Y	same.....	21	3	99	100	B	
1469	Leaming.....	Y	Jas. Scott, Jr., Adams Mills.....	17	3	93	100	T	Dried in the fall in a loft.
1470	"	Y	same.....	17	2	100	100	M	
1471	"	Y	same.....	17	2	100	100	B	
1472	"	Y	same.....	17	3	96	100	T	From crib.
1473	"	Y	same.....	18	3	80	100	M	
1474	"	Y	same.....	17	3	95	100	B	
1475	Scott's Yellow Dent	Y	same.....	17	3	98	100	T	Dried in a loft in the fall.
1476	"	Y	same.....	17	2	100	100	M	
1477	"	Y	same.....	18	2	100	100	B	
1478	"	Y	same.....	18	2	97	100	T	From crib.
1479	"	Y	same.....	16	3	94	100	M	
1480	"	Y	same.....	17	2	100	100	B	
1481	Y	Frank J. Mishler, Magadore	16	1	100	50	T	Dried in a warm place, and kept in a dwelling house.
1482	Scott's Yellow Dent	Y	same.....	16	1	100	50	M	
1483	"	Y	same.....	18	2	100	50	B	

1484	Leaming.....	Y	A. N. Sutliff, Greenwich.....	17	2	96	100	T	Cured near a warm stove pipe.
1485	".....	Y	same.....	17	2	97	100	M	
1486	".....	Y	same.....	16	2	94	100	B	
1487	".....	Y	Jas. Boyd, Plain City.....	16	4	78	50	T	Taken from shock in February.
1488	".....	Y	same.....	16	2	72	50	M	
1489	".....	Y	same.....	16	4	94	50	B	Gathered in October, and well kept.
1490	".....	Y	Dr. J. Converse, Plain City.....	19	2	96	50	T	
1491	".....	Y	same.....	18	2	100	50	M	
1492	".....	Y	same.....	19	2	100	50	B	Kept in a loft without fire.
1493	Early Mammoth.....	Y	A. E. Wiseman, Covington.....	19	2	93	95	T	
1494	".....	Y	same.....	19	2	100	100	M	
1495	".....	Y	same.....	20	2	95	100	B	Dried in the cellar.
1496	Milligan.....	Y	A. A. Wise, Bellaire.....	18	2	100	100	T	
1497	".....	Y	same.....	18	2	98	100	M	
1498	".....	Y	same.....	19	3	98	100	B	
1499	Leaming.....	Y	W. J. Mathie, New Berlin.....	22	2	100	100	T	
1500	".....	Y	same.....	21	2	100	100	M	
1501	".....	Y	same.....	21	2	100	100	B	
1502	Yellow Dent.....	Y	Frank B. Stafford, New Carlisle.....	16	3	96	100	T	
1503	".....	Y	same.....	16	2	97	100	M	
1504	".....	Y	same.....	18	2	98	100	B	
1505	".....	W	T. H. Housell, Blanchester.....	16	2	100	100	M	
1506	".....	Y	same.....	16	3	100	100	M	
1507	Ohio Prolific.....	W	Geo. F. Parrett, Greenfield.....	19	2	99	100	T	
1508	".....	W	same.....	19	1	99	100	M	
1509	".....	W	same.....	19	4	98	100	B	
1510	Leaming.....	Y	Alva. A. Wise, Bellaire.....	19	1	100	100	T	From crib.
1511	".....	Y	same.....	19	2	100	100	M	
1512	".....	Y	same.....	19	4	99	100	B	
1513	".....	Y	Hiram B. Hosler, Chardon.....	19	4	100	100	T	Hung in the dwelling by part of the husk.
1514	".....	Y	same.....	19	4	100	50	M	
1515	".....	Y	same.....	19	2	100	50	B	
1516	".....	W	Jas. D. Allison, Cherry Fork.....	23	3	97	100	T	Kept in a cold room in the dwelling.
1517	Leaming.....	W	same.....	23	3	100	100	M	
1518	".....	W	same.....	23	3	99	100	B	
1519	Hackberry (a cross).....	Y	Emanuel Eckler, Elyria.....	18	3	97	100	T	Spread one foot deep on a slab rack.
1520	".....	Y	same.....	24	3	98	100	M	
1521	".....	Y	same.....	24	3	96	100	B	

SEED TESTS.—TABLE I.—Continued.

Test number.	Variety.	Color of grain.	Tested for—	First seed sprouted— hours.	Last seed sprouted— days.	Total seed sprouted— per cent.	Number of ears seed taken from.	Place on the ear.	Remarks.
1522	White Dent.....	W	J. M. Merrill, Friendship.....	24	3	99	100	T	From crib.
1523	".....	W	same.....	24	2	100	100	M	
1524	".....	W	same.....	24	3	99	100	B	
1525	Leaming.....	Y	J. B. Coun, Hackney.....	24	3	99	100	T	Ricked in a warm room.
1526	".....	Y	same.....	24	3	100	100	M	
1527	".....	Y	same.....	21	3	99	100	B	
1528	Mixed Varieties.....	.....	D. W. Terrell, New Antioch.....	21	3	89	100	T	From crib.
1529	".....	.....	same.....	21	3	91	100	M	
1530	".....	.....	same.....	21	3	96	100	B	
1531	Improved Clarage.....	Y	Wm. Henderson, Sabina.....	18	2	94	100	T	Kept in dwelling.
1532	".....	Y	same.....	20	4	100	100	M	
1533	".....	Y	same.....	24	4	95	100	B	
1534	Cassiday.....	Y	J. B. Hein, Minerva.....	24	2	93	100	T	Dried on shelves in dwelling.
1535	".....	Y	same.....	24	2	99	100	M	
1536	".....	Y	same.....	24	4	92	100	B	
1537	Leaming.....	Y	John L. Zollinger, Thornville.....	22	4	95.6	100	.....	Scattered on barn floor.
1538	Golden Beauty.....	Y	P. A. Graham, Xenia.....	25	4	87.7	49	T	Dried by fire in smoke-house,
1539	".....	Y	same.....	25	4	91.8	49	M	then hung in cellar.
1540	".....	Y	same.....	25	4	90	50	B	
1541	Chester County.....	Y	same.....	22	3	98	50	T	Hung in crib until frost, then
1542	".....	Y	same.....	22	3	100	50	M	hang in cellar.
1543	".....	Y	same.....	22	3	100	48	B	
1544	Leaming.....	Y	L. W. Skipton, Waterford.....	22	3	96	100	T	Kept in vacant room in dwell-
1545	".....	Y	same.....	23	3	100	100	M	ing.
1546	".....	Y	same.....	22	2	100	100	B	

SEED TESTS.—TABLE I.—Continued.

Test number.	Variety.	Color of grain.	Tested for—	First seed sprouted— hours.	Last seed sprouted— days.	Total seed sprouted— per cent.	Number of ears seed taken from.	Place on the ear.	Remarks.
1584	Leaming.....	Y	H. H. Wheeler, Ridgeville.....	19	3	84	100	T	Spread on granary floor.
1585	".....	Y	same.....	19	5	91	100	M	
1586	".....	Y	same.....	19	3	100	100	B	From crib.
1587	".....	Y	same.....	23	5	84	100	T	
1588	".....	Y	same.....	22	3	94	100	M	
1589	".....	Y	same.....	24	5	69	100	B	
1590	".....	Y	Jos. Atkinson, Pataskala.....	22	4	90.9	99	T	
1591	".....	Y	same.....	22	4	97	100	M	
1592	".....	Y	same.....	21	4	97	100	B	
1593	".....	Y	same.....	21	4	91	100	T	
1594	Leaming.....	Y	C. B. Lewis, Olifton.....	20	3	99	100	M	Dried on shelves in a room where there was a fire.
1595	".....	Y	same.....	21	5	99	100	B	
1596	".....	W	same.....	22	5	85	100	T	Dried in barrels in a room where there was a fire.
1597	Leaming.....	W	same.....	22	5	91	100	M	
1598	".....	W	same.....	21	5	100	100	B	Station store room. Dried between joists in barn.
1599	".....	Y	The Station.....	20	3	98	50	M	
1600	".....	W	H. A. Weber, Columbus.....	22	2	100	4	M	Dried in fall and kept in barn.
1667	Farmer's Favorite.....	Y	S. E. Williamson, Hooker.....	22	2	99	100	T	
1668	".....	Y	same.....	22	2	100	100	M	From crib 6 feet wide, lath on one side.
1669	".....	Y	same.....	26	2	100	100	B	
1670	Leaming.....	Y	Huse Bone, Lebanon.....	22	2	94	100	T	Piled 4 feet deep in a loft.
1671	".....	Y	same.....	21	2	99	100	M	
1672	".....	Y	same.....	23	2	99	100	B	
1673	".....	Y	same.....	22	2	98	100	T	
1674	".....	Y	same.....	22	2	100	100	M	
1675	".....	Y	same.....	21	2	100	100	B	

Year	Improved Clorage	Y	R. H. Morrow, Washington C. H.	21	2	98	100	T
1676	Improved Clorage	Y	same	21	2	98	100	T
1677	"	Y	same	21	2	99	100	M
1678	"	Y	same	21	2	97	100	B
1679	Leaming	Y	Daniel Myers, Troy	20	2	86	100	T
1680	"	Y	same	20	2	67	100	M
1681	"	Y	same	23	2	86	100	B
1682	"	Y	Jas. O. Thomas, Raymonds	20	1	100	100	T
1683	"	Y	same	19	2	97	100	M
1684	"	Y	same	19	2	99	100	B
1685	Pride of the North	Y	J. A. Stokes, Clyde	19	2	98	100	T
1686	"	Y	same	19	1	95	100	M
1687	"	Y	same	19	2	100	100	B
1688	"	Y	Amos Shinn, Ridge	19	2	98	100	M
1689	Pride of the North	Y	same	22	2	100	100	B
1690	"	W	same	19	2	98	100	M
1691	Pride of the North	W	same	21	2	97	100	B
1692	Leaming	Y	W. M. McDill, Morning Sun	21	2	99	100	T
1693	"	Y	same	19	1	100	100	M
1694	"	Y	same	21	2	97	100	T
1695	"	Y	same	21	2	99	100	B
1696	"	Y	same	20	2	100	100	M
1697	"	Y	same	21	2	98	100	B
1698	Leaming X Montgomery	Y	Chas. W. Haldy, Camp Chase	21	2	99	100	T
1699	"	Y	same	19	3	100	100	M
1700	"	Y	same	.....	3	99	100	B
1701	"	Y	O. W. Scott, Camp Chase	.....	3	96	100	T
1702	Leaming X Montgomery	Y	same	19	2	100	100	M
1703	"	Y	same	20	3	98	100	B
1704	Gourdseed	Y	Alex. Simpson, Carrollton	21	3	94	100	T
1705	"	Y	same	21	2	99	100	M
1706	"	Y	same	21	4	93	100	B
1707	Leaming	Y	Geo. W. Dozer, Deavertawn	21	4	97	100	T
1708	"	Y	same	20	2	99	100	M
1709	"	Y	same	22	4	99	100	B
1710	Golden Yellow	Y	A. J. Brelsford, Fletcher	22	6	83.3	95	T
1711	"	Y	same	22	4	70.5	95	M
1712	"	Y	same	22	4	99	95	B
1713	Yellow Acme	Y	D. Saiken, Northwood	22	2	94	100	M

TABLE I.—SEED TESTS.—Continued.

Test number.	Variety.	Color of grain.	Tested for—	First seed sprouted— hours.	Last seed sprouted— days.	Total seed sprouted— per cent.	Number of ears seed taken from.	Place on the ear.	Remarks.
1714	Yellow Acme	Y	D. S. Aikin, Northwood	22	2	100	100	T	Hung up by husk.
1715	"	Y	same	22	2	99	100	M	
1716	"	Y	same	22	4	100	100	B	
1717	"	Y	J. F. Henning, Wilkinsburg, Pa.	22	4	98	50	T	Kept in cellar in drying frame.
1718	Yellow Acme	Y	same	22	2	100	50	M	
1719	"	Y	same	22	4	98	50	B	
1720	"	Y	same	22	2	88	50	T	From crib.
1721	"	Y	same	22	2	98	50	M	
1722	"	Y	same	22	2	96	50	B	
1723	"	Y	J. Q. Baker, Lebanon	23	2	59	100	M	From crib.
1724	Yellow Acme	W	same	22	2	75	100	M	From crib.
1725	"	W	same	20	2	97	100	M	Dried over stove then put in open barrels.
1726	Evergreen (Sweet)	Y	same	20	2	95	100	M	
1727	Leaming	Y	E. D. Wheeler, Springfield	20	2	95	100	T	
1728	"	Y	same	19	5	99	100	M	Hung by husk in carriage house.
1729	"	Y	same	19	5	99	100	B	
1730	"	Y	Phillip Erf, Monroeville	23	5	64	100	T	
1731	Leaming	Y	same	22	5	74	100	B	Husked in December, cribbed.
1732	"	Y	same	18	4	95	100	T	
1733	Early Hackberry	Y	N. C. Johnson, Bedford	18	4	100	.....	T
1734	Leaming	Y	L. Gillilan, Jackson	17	3	100	100	M	Shelled in fall and kept in ex- posed room.
1735	"	Y	same .....	.....	.....	.....	.....	T
1736	"	W	same	18	3	98	100	T	
1737	Henry	W	same	18	3	98	100	M	
1738	"	W	same	18	3	98	100	M	
1739	"	W	same	18	4	100	100	B	

1740	Decker	Y	J. K. Miller, Millersport	18	4	100	100	T	Kept in loft over crib.
1741	"	Y	same	18	3	98	100	B	
1742	Leaming	Y	Thomas McKee, New Carlisle	18	3	100	100	T	Hung up till cold weather, then put in barrels in dwelling.
1743	"	Y	same	18	3	100	100	M	
1744	"	Y	same	24	5	92	100	B	
1745	Einsel	Y	Henry Baumgardner, Lancaster	23	4	95	100	T	Kept in loft over crib.
1746	"	Y	same	23	4	100	100	M	
1747	"	Y	same	23	4	98	100	B	
1748	"	Y	same	23	4	88	50	T	
1749	Einsel	S	W. C. Pinkham, Loveland	23	3	98	50	M	Dried in dry house, then kept in loft of outbuilding.
1750	"	S	same	23	4	98	50	B	
1751	Improved Clarge	Y	Emmett Mix, Avenue	21	2	68	100	T	Kept in loft over crib.
1752	"	Y	same	20	2	90	100	M	
1753	"	Y	same	22	3	64	100	B	
1754	"	Y	same	21	3	89	100	T	
1755	"	Y	same	21	2	98	100	M	Kept in loft over crib.
1756	"	Y	same	20	3	94	100	B	
1757	Leaming	Y	Luther Neer, Catawba	23	3	94	100	T	Dried on barn floor, then kept in barrels in barn.
1758	"	Y	same	23	3	97	100	M	
1759	Heckman	Y	S. E. Minnick, Potsdam	23	3	95	100	B	
1760	"	Y	same	19	4	94	50	T	Hung up by husk in dwelling.
1761	"	Y	same	19	2	100	50	M	
1762	"	Y	same	21	2	100	50	B	
1763	"	Y	John Gould, Aurora	22	4	99.5	.....	..
1764	Common Yellow	Y	James Inlchen, Port Clinton	22	2	82	100	T	From granary.
1765	"	Y	same	21	2	95	100	M	
1766	"	Y	same	23	4	98	100	B	
1767	"	Y	same	21	4	98	100	T	Kept on the floor over kitchen.
1768	"	Y	same	22	2	98	100	M	
1769	"	Y	same	22	2	98	100	B	
1770	Golden Dent	Y	same	21	4	86	100	T	Kept over piggery.
1771	"	Y	same	19	2	95	100	M	
1772	"	Y	same	20	2	92	100	B	
1773	"	Y	Ed. Harrison, Columbus	20	3	95	100	T	From barn.
1774	Golden Dent	Y	same	20	2	100	100	M	Kept in warm loft.
1775	"	Y	same	20	2	100	100	B	From crib.
1776	Leaming	Y	J. S. Funk, West Liberty	20	2	94	100	M	From shock.
1777	"	Y	same	22	3	100	15	.....
1778	Calico	S	same	22	3	100	.....	.....
1779	"	W	same	22	3	68	.....	.....

SEED TESTS.—TABLE I.—Continued.

Test number.	Variety.	Color of grain.	Tested for—	First seed sprouted— hours.	Last seed sprouted— days.	Total seed sprouted— per cent.	Number of ears seed taken from.	Place on the ear.	Remarks.
80	—	Y	John Gould, Aurora.....	19	6	95.5	Exposed in open crib.
81	Improved Clarage.....	Y	Emmett Mix, Avenue.....	19	3	85	.....	.....
88	—	Y	A. B. Zollars, Napoleon.....	19	3	98	100	T	
89	Improved Clarage.....	Y	same.....	19	3	100	100	M	
90	"	Y	same.....	19	6	100	100	B	

CURING AND KEEPING CORN.

Some experiments were made at the Station to ascertain the effect upon its vitality of different methods of keeping corn. The experiments, however, were quite incomplete and somewhat unsatisfactory.

The materials from which the selections were to be made were so few that it was found impossible to make any satisfactory tests upon modes of curing. One lot of flint corn consisting of several varieties, and six lots of yellow dent (Leaming) corn were selected the middle of December, 1884, and placed under different conditions, there to remain and be tested at intervals throughout the winter and spring. The lot of flint corn was taken from an open loft over a piggery where it had lain spread a few inches deep since it was husked early in November. The Leaming variety was all taken from one bin, where it had been in a pile several feet deep since the early part of November.

In the table given below (Table II), lot A is the flint varieties; all the others are of the Leaming variety of dent. Lots A and B were together put in a barrel in a dry basement cellar where the temperature fell to 4° or 5° below freezing twice during the winter. Lot C was placed on laths between joists in the ceiling of the same cellar. Lot D was placed on laths in a similar manner, but over the boiler used for heating the green-houses, where it is always very dry and warm, the temperature often rising to 10°. The corn was placed at a distance of three and a half feet above the boiler. Lot E was put in a box with openings in the sides to admit of the same circulation of air and variation of temperature as would take place in the bin in which it was placed with three or more feet of corn on all sides. Lot F was hung up, each ear by itself, where it was freely exposed to the winds and changes of temperature, but protected by a roof from rain and snow. Lot G was buried in a vineyard, three inches deep; the soil was a somewhat gravelly clay loam, with a southern exposure, sloping enough to quickly carry off all surface water.

In the table, the dates at the head of the columns indicate the time at which the tests were begun, and the figures in the columns the per cent. of seeds that germinated in the tests begun at those dates. The results of these tests show that corn properly cured and kept dry is not apt to receive very great injury from the ordinary variations in temperature of Central Ohio. The lot exposed (F), appears to have been injured to some extent, as shown in the variously increasing and decreasing per cents. of germinated seeds in the tests of the series. In buried lot (G) there was a rapid diminution of vitality until it all perished. On the 16th of March, the kernels were more or less blackened and decayed, and on the 13th of April, no kernels could be found that appeared to be sound.

SEED TESTS.—TABLE II.—CORN KEPT UNDER DIFFERENT CONDITIONS.

	Dec. 18.	Jan. 8.	Jan. 21.	March 16.	April 13.	April 20.	June 29.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
A.....	98	.....	96	.....	.....	100	.....
B.....	99	.....	97	.....	.....	100	.....
C.....	98	.....	99	.....	.....	99	99
D.....	98	.....	98	.....	.....	97	98
E.....	98	99	100	94	99	.....	98
F.....	99	92	97	98	95	.....	91
G.....	96	78	42	0	0	.....	.....

DUPLICATE GERMINATIONS.

As shown in the table, there appears to be no loss of vitality from a reasonable length of time after the corn is harvested until about the time for seeding, in corn that is properly cured. The same table may serve to show a series of duplicate tests of germinations.

Thus lots B to G, inclusive, were all of the same variety of corn (Leaming), taken from the same bin at the same date. The greatest difference in the per cent. germinated in the tests of the first date was 3 per cent. between lot G which was the lowest, and lots B and F which gave the highest germinations. The averages of the differences in per cent. germinated in these six tests was but 1.67 per cent.

The widest differences in the per cent. germinated in the five lots B to F, inclusive, for the whole series of tests are found in lot F. In the series for this lot there is a decrease of 7 per cent. from the germination of December 18th, to that of January 8th; then there is an increase in the per cent. germinated in the next two tests, then a decrease to the last which is 8 per cent. lower than the first test. Lots C and D show the least variation for the whole series, each varying but 1 per cent. Comparing the series of tests in each lot (B to F, inclusive), with the first test the respective lots give a series of 23 duplicates, and show an average difference in germination of a little less than 1.7 per cent. Comparing them as above, and also all the tests of each date with the best results for that date, they give a series of 46 duplicate germinations, and show an average difference of but a little over 1.7 per cent. in the number of seed germinated.

VARIETIES OF CORN PLANTED AT THE STATION.

In Table III are given the germination tests of the varieties of field corn used in field experiments.

In the column, "color of grain," the letter "Y" signifies that the grain is of a yellow color; this includes the yellow white-cap varieties as well as the various shades of yellows. "W," signifies white; "R," red, and "S," striped or spotted. In the next column to the right, "D," signifies that it is a dent variety, and "F," that it is a flint variety. In the column, "number of ears," is given the number of ears from which each sample tested was taken.

These tests were from specimen ears sent to the Station by the individuals and seedsmen indicated.

An average of 88.7 per cent. germinated of all the corn tested, the results of which are shown in the table; of the dent varieties 88.1 per cent. germinated, and of the flint varieties 92.7 per cent. germinated. In 42.7 per cent. of the tests every kernel sprouted. In 74.4 per cent. of the tests, 90 per cent. or more, of the kernels sprouted.

SEED TESTS.—TABLE III.—VARIETIES OF FIELD CORN USED IN EXPERIMENT PLOTS.

Test number.	Variety.	Color of grain.	F—Flint. D—Dent.	Received from—	Number of ears.	Germinated—per cent.
1601	Large Yellow.....	Y	F	Peter Henderson & Co., New York, N. Y.....	2	95
1602	Chester Co. Mammoth.....	Y	D	same.....	2	100
1603	Queen of the Prairie.....	Y	D	same.....	2	100
1604	Golden Dew-drop.....	Y	F	same.....	2	100
1605	Longfellow.....	Y	F	same.....	2	95
1606	Compton's Early.....	Y	F	same.....	2	85
1607	King Phillip.....	Y	F	same.....	2	90
1608	Mammoth White Surprise.....	W	D	same.....	2	95
1609	Leaming.....	Y	D	same.....	2	100
1610	Farmer's Favorite.....	Y	D	same.....	2	100
1611	White Flint.....	W	F	same.....	2	100
1612	Compton's Early.....	Y	F	same.....	2	90
1613	Golden Bantam.....	Y	D	same.....	2	100
1614	Lockawaxen.....	Y	D	same.....	2	100
1615	Wauhakum.....	Y	F	A. E. Blount, Fort Collins, Col.....	1	100
1616	Pride of the North.....	Y	F	same.....	1	100
1617	—.....	Y	D	same.....	1	100
1618	—.....	S	D	D. W. Terrell, New Antioch.....	3	96.6
1619	Scott's Yellow Dent.....	R	D	same.....	3	96.6
1620	Union Co. White.....	Y	D	Jas. Scott, Jr., Adams Mills.....	3	100
1621	Golden Blossom.....	W	D	W. M. Woodworth, Irwin.....	2	60
1622	Hill's Best.....	Y	D	same.....	3	86.6
1623	Maryland Dent.....	Y	D	same.....	1	100
1624	Golden Dent.....	Y	D	B. P. Mann, East Plymouth.....	4	6
						90

SEED TESTS.—TABLE III.—Continued.

Test number.	Variety.	Color of grain.	F—Flint. D—Dent.	Received from—	Number of ears.	Germinated, per cent.
1625	Leaming	Y	D	J. B. Conn, Hackney.....	1	100
1626	—.....	Y	D	.....	4	100
1627	—.....	Y	D	.....	2	100
1628	Leaming	Y	D	James Riley, Thornton, Ind.....	3	83.3
1629	Pride of the North.....	Y	D	same	3	93.3
1630	Riley's Favorite.....	Y	D	same	4	90
1631	Munn's.....	Y	D	same	3	96.6
1632	Boone Co. White.....	W	D	same	3	40
1633	Golden Yellow	W	D	same	3	3.3
1634	White Dent, 1.....	W	D	Seth R. Hanchett, Twinsburgh.....	1	100
1635	“ 2.....	W	D	same	1	100
1636	“ 3.....	W	D	same	1	90
1637	“ 4.....	W	D	same	1	30
1638	Illinois Premium Dent.....	Y	D	J. C. Vaughan, Chicago, Ill.....	2	75
1639	Cranberry	Y	D	same	2	85
1640	Smith's Improved Yellow.....	W	D	Nathan Smith, West Baltimore.....	4	90
1641	Thompson	Y	D	Lafayette Thompson, Raymonds.....	3	100
1642	McCoy	S	D	T. G. Webb, Atica, Ind.....	3	76.6
1643	—.....	Y	D	M. H. McCoy, Van Wert.....	.....	100
1644	—.....	Y	D	G. Tozer, Strasburgh.....	4	100
1645	Leaming	Y	D	V. H. Fillman, Arcanum.....	3	60
1646	“	Y	D	John K. Bradfute, Clinton.....	4	100
1647	—.....	Y	D	Lewis Legg, Clintonville.....	4	97.5
1648	Perfection.....	Y	D	A. Woodling & Sons, Beach City.....	3	86.6

1649	Pride of the North.....	Y	D	P. Zigler, Strasburgh.....	4	97.5
1650	Horse Tooth.....	W	D	A. H. Lindsay, Portsmouth, Va.....	3	96.6
1651	.....	Y	D	W. J. Mathie, Greentown.....	2	100
1652	Clarage.....	Y	D	A. W. Livingston's Sons, Columbus.....	3	96.6
1653	Early Dawn.....	W	D	same.....	3	90
1654	Champion White Beard.....	W	D	same.....	3	100
1655	Beard's White Pearl.....	W	D	same.....	3	100
1656	Leaming.....	Y	D	same.....	3	96.6
1657	Pride of the North.....	Y	D	same.....	4	100
1658	Bloody Butcher.....	R	D	R. G. Crist, New Market, Ind.....	4	100
1659	Farmer's Favorite.....	Y	D	same.....	4	10.1
1660	Burpee's Golden Beauty.....	Y	D	same.....	1	100
1661	.....	W	D	F. M. Watkins, Collett, Ind.....	3	93.3
1662	Calico.....	.....	D	E. C. Smith, Marengo, Ill.....	4	97.5
1663	.....	S	D	E. A. Smith, ".....	4	100
1664	Hiawassee.....	W	D	W. M. Woodworth, Irwin.....	4	32.5
1665	Blood Butcher.....	R	D	Wm. Moore, New Vienna.....	3	100
1666	Golden Beauty.....	Y	D	E. R. Walker, Norwich.....	2	100
1667	.....	Y	D	G. F. Parrett, Greenfield.....	4	97.5
1668	.....	Y	F	Emory A. Prior, Cuyahoga Falls.....	4	92.5
1669	Dutton.....	Y	F	same.....	4	80
1670	Longfellow.....	Y	F	same.....	4	100
1671	White Cap.....	W	D	same.....	4	100
1672	Small Dent.....	Y	D	same.....	4	77.5
1673	.....	W	D	same.....	4	30
1674	Golden Beauty.....	Y	D	S. E. Minnick, Potsdam.....	2	100
1675	Heckman.....	Y	D	same.....	2	85
1676	.....	Y	D	J. M. Allen, Washington C. H.....	4	92.5
1677	Dodridge.....	Y	D	same.....	4	92.5
1678	Clarage.....	Y	D	same.....	3	96.7
1679	.....	Y	D	same.....	3	70
1680	Bounds.....	Y	D	same.....	3	100
1681	.....	R	D	same.....	4	100
1682	Leaming.....	Y	D	Slater Brown, Barton.....	.....	66
1683	Gloria Solis.....	Y	D	V. H. Hallock, Son & Thorpe, Queens, N. Y.....	.....	22

SWEET CORN.

The vitality tests of sweet or sugar corn used in the field experiments are exhibited in Table IV. With few exceptions the corn germinated well. Sweet corn does not, as a rule, germinate so quickly as field corn, and requires more moisture in germinating.

Sweet corn is less liable to injury from early or extreme cold than field corn, because; first, it ripens earlier in the season, and has a longer time to dry before cold weather sets in; and, second, because it is usually left to ripen more thoroughly before cutting, and dries more on the stalk before husking and cribbing.

The average for all the tests of sweet corn was 80.9 per cent of germinated seeds. There was one variety—Garden Queen (No. 1807)—that failed entirely to sprout. Ninety per cent. and upwards of the seed germinated in a little over 50 per cent. of the tests; and 80 per cent. of the tests gave a germination of over 75 per cent.

SEED TESTS.—TABLE IV.—VARIETIES OF SWEET CORN USED IN EXPERIMENT WORK.

Test number.	Variety.	Received from—	First seed sputed— hours.	Last seed sputed— days.	Total seed sputed— per cent.	No. of seeds in one quart.	No. of seed sputed in one quart.
1792	Early Evergreen.....	A. W. Livingston's Sons, Columbus, O.....	23	4	94	3,492	3,282
1793	Stowell's Evergreen.....	same.....	23	3	92	3,334	3,067
1794	Red Cob Evergreen.....	same.....	23	3	100	2,561	2,561
1795	Rose's Improved Evergreen.....	Isaac F. Tillinghast, La Plume, Pa.....	16	3	82	3,329	2,730
1796	Cory.....	James J. H. Gregory, Marblehead, Mass.....	23	3	88	2,766	2,433
1797	".....	C. E. Allen, Brattleboro, Vt.....	23	3	96	2,766	2,655
1798	Early Montana.....	George H. Colvin, Dalton, Pa.....	23	3	98	4,098	4,016
1799	Ne Plus Ultra.....	Johnson & Stokes, Philadelphia, Pa.....	23	3	78	6,044	4,714
1800	Early Tom Thumb.....	Peter Henderson & Co., New York, N. Y.....	23	3	92	3,790	3,487
1801	White Marblehead.....	Jas. J. H. Gregory, Marblehead, Mass.....	23	3	92	2,663	3,450
1802	Marblehead Mammoth.....	A. W. Livingston's Sons, Columbus, O.....	23	4	100	3,227	3,227
1803	Mammoth.....	same.....	.....	3	62	2,766	1,715
1804	Extra Early Orange.....	O. M. Hovey & Co., Boston, Mass.....	.....	4	62	3,329	2,996
1805	Egyptian.....	A. W. Livingston's Sons, Columbus, O.....	.....	3	96	3,893	3,737
1806	Squantom.....	same.....	.....	3	56	4,968	2,782
1807	Garden Queen.....	Geo. H. Colvin, Dalton, Pa.....	.....	.....	0	4,450	0
1808	Black Mexican.....	A. W. Livingston's Sons, Columbus, O.....	.....	3	26	3,381	879
1809	Potter's Excelsior.....	Geo. H. Colvin, Dalton, Pa.....	.....	3	84	3,688	3,098
1810	Ambler Cream.....	A. W. Livingston's Sons, Columbus, O.....	.....	5	83	3,790	3,385
1811	Golden.....	C. E. Allen, Brattleboro, Vt.....	.....	3	58	2,971	1,723
1812	Hickox.....	Joseph Harris, Rochester, N. Y.....	.....	3	94	3,534	3,322
1813	Early Bonanza.....	Johnson & Stokes, Philadelphia, Pa.....	.....	3	90	2,930	2,628
1814	Improved Mammoth.....	Frank Ford & Son, Ravenna, O.....	.....	5	90	3,637	3,419
1815	Ford's Early.....	same.....	.....	3	94	3,278	3,081
1816	Early Minnesota.....	Peter Henderson & Co., New York, N. Y.....	28	3	96	2,971	2,852
1817	Crosby's Early.....	A. W. Livingston's Sons, Columbus, O.....	30	3	86	3,944	3,392

SEED TESTS.—TABLE IV.—Continued.

Test number.	Variety.	Received from—	First seed sputed— hours.	Last seed sputed— days.	Total seed sputed— per cent.	No. of seeds in one quart.	No. of seed sputed in one quart.
1818	New Triumph.....	Ohio State University, Columbus, O.....	.....	4	11.4	2,365	263
1819	New Pee and Kay.....	A. W. Livingston's Sons, Columbus, O.....	25	4	96	3,841	3,687
1820	Early Concord.....	same.....	24	3	94	3,227	3,033
1821	".....	Peter Henderson & Co., New York, N. Y.....	24	3	90	3,073	2,766
1822	Crosby's Early.....	same.....	30	3	98	3,893	3,815
1823	Henderson.....	same.....	30	3	82	3,329	2,730
1824	Perry's Hybrid.....	B. L. Bragg & Co., Springfield, Mass.....	30	3	100	3,124	3,124
1825	Adams' Early.....	A. W. Livingston's Sons, Columbus, O.....	30	4	70	2,927	2,044
1826	Adams' Extra Early.....	same.....	30	4	70	3,637	2,546
2284	Hickox.....	E. S. Teagarden, Davenport, Iowa.....	.....	3	84	2,857	2,400
2286	Tom Thumb.....	A. W. Livingston's Sons.....	.....	3	50	2,964	1,482
2287	Early Minnesota.....	same.....	.....	3	98	2,752	2,696
2288	Landreth's Sugar.....	same.....	.....	3	82	4,022	3,298
1289	Landreth's Sugar.....	David Landreth & Sons.....	.....	5	80	4,498	3,598

VEGETABLE SEEDS PLANTED AT THE STATION.

The vegetable seeds used in the experiment work in the garden department were tested for their vitality. The results are given in Table V.

This table exhibits in the column on the left, as in other tables of seed tests, the number of the test as kept on the Station records. The next column gives the name of the variety of seed; following the variety is the name of the individual or firm from whom the seed was obtained. In the columns to the right are given the per cent. of seed that germinated in each trial, the number of seeds of each variety in one ounce, determined from careful, accurate weighings and countings, and the number of germinated seeds in one ounce of each variety, computed from the total number of seeds in one ounce, and the per cent. that germinated in the trial. The same individual seeds were weighed, counted, and tested for vitality. With a few exceptions, fifty seeds were used in each germination test shown in this table.

The tests of the same variety from different seedsmen are, as a rule, grouped together in successive tests, for convenience in comparing them, each with the others, and with the same varieties in the field.

With cabbage seeds, the per cent. of seeds from the different packets that germinated reaches from one extreme to the other, as might be expected in so great a number of tests. The least vitality was found in a packet of Henderson's Early Summer, No. 2313, from Samuel Wilson, Mechanicsville, Pa., of which none germinated. Little better than this were two other packets of the same variety; one, No. 2301, from W. Atlee Burpee & Co., of Philadelphia, Pa., and the other, No. 2303, from Benson, Maule & Co., also of Philadelphia, from each of which a germination of only 6 per cent. was obtained. There were two other packets with very low vitality; one of Superior Late Flat Dutch, No. 2166, from W. Atlee Burpee & Co., only 12 per cent. of which sprouted, and another of Henderson's Early Summer, No. 2302, from Francis Brill, Riverhead, N. Y., with 18 per cent. sprouted. On the other hand, the highest degree of vitality was shown in a packet of Premium Flat Dutch, No. 1900, from Johnson & Stokes of Philadelphia, Pa., and one of Short Stem Drumhead, No. 1917, from Samuel Wilson, 100 per cent. of each having germinated. A germination of 90 per cent and above was obtained from fifty-two packets, or one third of the tests. In one hundred and fifteen, or nearly 74 per cent. of the tests, there was a germination of over 75 per cent.; and in only twelve packets—less than 8 per cent.—five of which have been noted above, was there a germination of less than 50 per cent. The average for the whole of the one hundred and fifty-six tests was 78.9 per cent. sprouted. (See table V.)

There was a marked difference in the weight of the seeds, the heaviest, No. 1945, weighing nearly three times as much as the lightest, No. 2303. This difference is quite remarkable to be found in a single species of plant in which man's endeavor has not been to modify the seed, but his whole effort directed to another part of the plant. Even in the same variety there is a very great difference in the weight. Compare No. 2302 and No. 2303.

There seems to be no relation whatever between the weight of the seed and the vitality, for among the heavy and the light seeds there were about equally good and poor germinations.

The tests of radish seeds were fewer in number, but exhibit nearly as wide a variation in per cent. sprouted. The poorest germination was from a packet of Long Scarlet, (imported seed) No. 2026, from David Landreth & Sons, of which only 12 per cent. sprouted. The best result was obtained from a packet

of White Spanish, No. 2039, from D. Landreth & Sons, Philadelphia, Pa., which gave 100 per cent. germinated. The second poorest germination was from a packet of White Tipped Turnip, No. 2023, from the last named firm, and the second best from Mammoth Summer, No. 2034, from A. W. Livingston's Sons, Co umbus. O., 98 per cent. of which germinated. The average number that sprouted in all the tests was 64.86 per cent.

The difference in the weight of the seeds in different packets is much less than in the cabbage seeds, the lightest, No. 2031, being more than half as heavy as the heaviest, Nos. 2026 and 2047.

The poorest lettuce seed was a packet of Drumhead, No. 2093, from W. Atlee Burpee & Co., Philadelphia, none of which sprouted. Earliest Cutting from D. Landreth & Sons, gave a germination of only 2 per cent., and nearly as poor as this was another packet from the same firm, Bloomsdale Butter, No. 2060, and one also from W. Atlee Burpee & Co., Burpee's Silver Bell, No. 2092, only 4 per cent. of each having germinated. The highest germination was from Yellow Seeded Butter, No. 2061, from W. Atlee Burpee & Co., Bloomsdale Early Summer, No. 2068, Royal Cabbage, No. 2077, and Speckled Dutch Butter, No. 2079, from D. Landreth and Sons, and White Seeded Simpson, No. 2071, and Black Seeded Simpson, No. 2072, from A. W. Livingston's Sons, every seed in each of these six packets having sprouted.

The tests of onion seed were very unsatisfactory. The tester, when adjusted so as to procure the best results from many other seeds, is not adapted to test onion seed with satisfaction.

Nearly all of the turnip seed was procured from one seed firm, and as there is a high per cent. of germination without great variation, and a good deal of uniformity in the weight of the seed, further comparison than is shown plainly in the table is not necessary.

The general low germination of the cauliflower seed is noticeable. Usually the per cent. that germinated is about the same as that of cabbage; but the tests fall quite a way below the tests of cabbage seed this year. The cause for this has not been ascertained. The weight of the seeds from the different packets is quite uniform, although one sample, No. 2192, is much lighter than the average.

The beans germinated very well with very few exceptions, there being but three tests in which less than fifty per cent. sprouted. The poorest sample was Ivory Pod Wax, No. 2244, from W. Atlee Burpee & Co., only ten per cent. germinating. The two others with low vitality were Brown Speckled Valentine, No. 2224, from D. Landreth & Sons, and New Golden Wax, No. 2246, from Benson, Maule & Co. In eight samples,—almost 20 per cent. of the tests—every bean in each test sprouted.

There are several different species of bean represented in the table, and to this is mostly due the difference in weight, although there is quite a variation in the different varieties of the same species, and some in the same variety. It will be observed that of the beans, and also of the peas, the two columns in the right give the number of seeds in a quart, instead of an ounce as in the first part of the table.

There were four samples of peas of which less than 50 per cent. sprouted, and three of these were very poor. The poorest was Yorkshire Hero, No. 2281, from D. Landreth & Sons; the next, another sample of the same variety, No. 2279, from A. W. Livingston's Sons, which germinated 2 per cent., and the third Carter's Little Wonder, No. 2280, from D. M. Ferry & Co., that gave eight per cent. of sprouted seeds. The highest per cent. of germinated seeds was produced by First and Best, No. 2257, from Hiram Sibley & Co., being 98 per cent.

SEED TESTS.—TABLE V.—VARIETIES OF VEGETABLES USED IN EXPERIMENT WORK.

Test number.	Variety.	From—	Germinated—per cent.	No. of seeds in one ounce.	No. of seeds in one ounce that germinated.
CABBAGE.					
1841	Early Etampes.....	D. M. Ferry & Co., Detroit, Mich.....	88	8,278	6,405
1842	".....	Jas. J. H. Gregory, Marblehead, Mass.....	94	9,808	9,240
1843	".....	Benson, Maule & Co., Philadelphia, Pa.....	70	8,278	5,795
1844	".....	Francis Brill, Riverhead, N. Y.....	62	7,654	7,445
1845*	Early Drumhead St. John's Day.....	Vilmoirin, Andrieux et Cie.....	90	7,711	6,940
1846	".....	Francis Brill.....	96	9,242	8,872
1847	Early Bleichfield Giant.....	D. Landreth & Sons, Philadelphia, Pa.....	90	8,732	7,559
1848	".....	Isaac F. Tillinghast, La Plume, Pa.....	88 9	5,783	5,141
1849	".....	same.....	86	6,804	5,851
1850	".....	Benson, Maule & Co.....	90	6,350	5,715
1851	Early Tourlaville.....	same.....	92	7,031	6,469
1852	Early Deep Head.....	Jas. J. H. Gregory.....	70	7,484	5,239
1853	Early Wyman.....	same.....	86	8,732	7,510
1854	Early Flat Dutch.....	Benson, Maule & Co.....	94	5,897	4,543
1855	".....	Peter Henderson & Co., New York.....	78	5,998	5,926
1856	".....	D. M. Ferry & Co.....	92	6,747	6,207
1857	".....	David Landreth & Sons.....	80	8,959	7,167
1858	Newark Early Flat Dutch.....	Francis Brill.....	86	8,861	5,900
1859	".....	D. M. Ferry & Co.....	86	6,407	5,510
1860	".....	Jas. J. H. Gregory.....	94	6,577	6,182
1861	".....	Jos. Harris, Rochester, N. Y.....	82	7,484	6,137
1862	Fottler's Improved Brunswick.....	Isaac F. Tillinghast.....	96	9,355	8,981
1863	Johnson & Stokes' Earliest.....	Johnson & Stokes, Philadelphia, Pa.....	90	6,64	5,471
1864	Landreth's Earliest.....	David Landreth & Sons.....	90	10,093	9,084
1865	".....	same.....	90	8,505	7,654

* Seed two years old.

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	No. of seeds in one ounce.	No. of seeds in one ounce that germinated.
CABBAGE.—Continued.					
1866	Lundreth's Large York	David Lundreth & Sons.....	86	7,484	6,436
1867	Large York	James Vick, Rochester, N. Y.....	50	7,031	3,515
1868	Low's Peerless	A. W. Livingston's Sons, Columbus, O.....	90	7,825	7,042
1869	Low's Early Peerless	Jas. J. H. Gregory.....	90	7,598	6,838
1870	Little Pixie	James Vick	58	6,691	3,881
1871	Henderson's Premier.....	Peter Henderson & Co.....	92	8,618	7,909
1872	Early Winningstadt	A. W. Livingston's Sons	98	7,031	6,890
1873	"	D. Lundreth & Sons	58	11,340	5,577
1874	"	Jos. Harris	94	10,319	9,700
1875	"	Sam'l Wisn, Mechanicsville, Pa.....	98	8,732	8,557
1876	Wheeler's Imperial.....	James Vick	70	7,371	5,160
1877	The Warren	James J. H. Gregory.....	92	6,350	5,842
1889	Prize Flat Dutch	Benson, Maule & Co.....	88	8,108	7,135
1890	Pacific Green Flat Dutch.....	Francis Brill.....	80	10,432	8,346
1891	Excelsior Flat Dutch	same.....	86	7,428	6,388
1892	Prize Flat Dutch	same.....	92	7,541	6,938
1893	Bristol Flat Dutch	same.....	80	9,072	7,258
1894	Superior Late Flat Dutch.....	W. Atlee Burpee & Co., Philadelphia, Pa.....	66	7,825	5,758
1895	Excelsior Late Flat Dutch	Isaac F. Tillinghast.....	90	10,376	9,338
1896	Prize Flat Dutch	James J. H. Gregory.....	96	6,634	6,369
1897	Prize Flat Dutch	Samuel Wilson	52	9,299	4,835
1898	Late Flat Dutch	Peter Henderson & Co.....	84	7,144	6,001
1899	Prize Flat Dutch	same	82	7,541	6,184
1900	"	Johnson & Stokes.....	100	7,598	7,598
1901	"	A. W. Livingston's Sons	50	7,484	3,742
1902	"	Hiram Sibley & Co., Rochester, N. Y.....	84	7,825	6,573

903	Large Late Flat Dutch.....	same.....	86	7,484	6,436
904	Premium Flat Dutch.....	Jos. Harris.....	88	8,959	7,884
905	Excelsior Flat Dutch.....	same.....	80	7,938	6,350
906	".....	James Vick.....	76	8,959	6,809
907	".....	same.....	68	7,825	5,321
908	Premium Flat Dutch.....	same.....	94	8,278	7,781
909	".....	Isaac F. Tillinghast.....	96	7,58	6,968
910	Excelsior Flat Dutch.....	same.....	96	6,991	6,433
911	Premium Flat Dutch.....	same.....	76	8,051	6,119
912	".....	D. M. Ferry & Co.....	82	9,412	7,718
913	Bloodsdale Flat Dutch.....	David Landreth & Sons.....	86	8,278	7,119
914	Improved Brunswick.....	Benson, Maule & Co.....	98	10,206	10,002
815	".....	Isaac F. Tillinghast.....	96	6,464	6,205
816	".....	Francis Brill.....	82	7,484	6,137
817	Short Stem Drumhead.....	Samuel Wilson.....	100	7,484	6,137
918	Late American Drumhead.....	Isaac F. Tillinghast.....	82	9,072	8,165
919	".....	same.....	90	7,144	6,572
920	Royal German Drumhead.....	Johnson & Stokes.....	92	7,144	6,572
921	Premium Large Drumhead.....	D. M. Ferry & Co.....	88	8,392	7,385
922	Short Stem Drumhead.....	W. Allen, Burpee & Co.....	94	8,392	7,888
923	Bridgeport Late Drumhead.....	A. W. Livingston's Sons.....	90	7,258	6,532
924	Fowler's Drumhead.....	Jos. Harris.....	68	8,165	5,552
925	Improved Late Drumhead.....	Francis Brill.....	78	5,443	4,246
926	Stone Mason Drumhead.....	same.....	74	8,559	6,630
927	Silver Leaf Drumhead.....	same.....	88	9,185	8,083
928	Louisville Drumhead.....	same.....	76	7,631	5,344
929	Short Stem Drumhead.....	same.....	82	6,067	4,975
930	Large Red Dutch.....	same.....	76	6,634	5,042
931	Marblehead Mammoth Drumhead.....	Peter Henderson & Co.....	78	5,897	4,690
932	".....	D. M. Ferry & Co.....	70	9,412	6,300
933	".....	Jas. J. H. Gregory.....	80	7,825	6,200
934	".....	Benson Maule & Co.....	70	8,392	5,874
935	Green Glazed.....	Peter Henderson & Co.....	72	7,428	5,348
936	Late Mountain.....	David Landreth & Sons.....	82	8,732	7,160
937	Pomorian.....	Jas. Vick.....	68	7,314	4,974
938	Golden Savoy.....	Johnson & Stokes.....	94	6,577	6,182
939	Early Dwarf Ulm Savoy.....	D. M. Ferry & Co.....	96	9,412	9,036
940	Improved American Savoy.....	same.....	86	12,328	11,118
941	Perfection Drumhead Savoy.....	Francis Brill.....	96	7,258	6,968
942	Drumhead Savoy.....	A. W. Livingston's Sons.....	34	8,505	2,892

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seeds		Number seeds in one ounce that germinated.
				in one ounce.		
CABBAGE.—Continued.						
1943	Burpee's Surehead	W. Atlee Burpee & Co	92	7,938	7,303	
1944	Johnson & Stokes' Surehead	Johnson & Stokes.....	82	7,484	6,137	
1945	Maule's Surehead	Benson, Maule & Co.....	84	4,990	4,192	
1946	Burpee's Surehead	Francis Brill	80	6,804	5,443	
1947	Surehead	Samuel Wilson	84	7,144	6,287	
2158	Large Jersey Wakefield.....	David Landreth & Sons.....	76	7,825	5,947	
2159	Excelsior Flat Dutch	Jos. Harris.....	82	7,371	6,044	
2160	"	same.....	58	8,845	5,130	
2161	Premium Flat Dutch	same.....	64	8,815	5,661	
2162	Large Late Mountain	David Landreth & Sons	70	8,051	5,636	
2163	Burpee's Surehead	W. Atlee Burpee & Co	86	7,598	6,534	
2164	Short Stem Drumhead	same.....	94	7,144	6,715	
2165	Premium Late Flat Dutch	Hiram Sibley & Co	96	6,917	6,640	
2166	Superior Late Flat Dutch	W. Atlee Burpee & Co	12	6,917	830	
2167	Premium Flat Dutch	James Vick	94	7,598	7,142	
2168	Newark Flat Dutch.....	Jos. Harris.....	86	6,580	5,461	
2169	Large York	David Landreth & Sons	80	7,598	6,078	
2170	Early Summer	Hiram Sibley & Co	98	7,484	7,536	
2171	Early Bleichfield Giant	D. Landreth & Sons	88	7,484	6,586	
2172	Early Dwarf Flat Dutch	same.....	36	6,917	2,490	
2173	Early Jersey Wakefield.....	Hiram Sibley & Co	48	7,711	3,701	
2174	Landreth's Earliest.....	David Landreth & Sons	88	9,979	8,781	
2213	Selected Flat Dutch	Peter Henderson & Co	80	7,484	5,687	
2292	"	same.....	90	7,598	6,838	
2293	"	same.....	90	7,598	6,838	

2301	Henderson's Early Summer.....	W. Atlee Burpee & Co	6	8,278	497
2302	"	Francis Brill	18	6,010	1,082
2303	"	Benson, Maule & Co.,	6	13,041	782
2304	"	D. M. Ferry & Co	78	6,520	5,086
2305	"	Jas. J. H. Gregory	70	7,428	5,200
2306	"	Jos. Harris	86	7,655	6,582
2307	"	Peter Henderson & Co	80	7,654	6,123
2308	"	Johnsen & Stokes.....	32	6,691	2,141
2309	"	A. W. Livingston's Sons	94	7,258	6,823
2310	"	David Landreth & Sons	86	8,278	7,119
2311	"	Isaac F. Tillinghast	92	7,484	6,885
2312	"	James Vick	80	8,618	5,454
2313	"	Samuel Wilson	0	8,902	0
2314	Early Jersey Wakefield.....	Francis Brill	45	5,443	2,449
2315	Large Early Jersey Wakefield.....	same.....	68	6,180	4,202
2316	Early Jersey Wakefield.....	Benson, Maule & Co.,	82	6,294	5,161
2317	"	W. Atlee, Burpee & Co	58	7,562	4,386
2318	"	D. M. Ferry & Co	88	5,892	5,185
2319	"	Jas. J. H. Gregory	76	6,407	4,896
2320	"	Jos. Harris	72	6,917	4,980
2321	"	Peter Henderson & Co	74	6,407	4,741
2322	"	Johnson & Stokes	88	6,861	6,038
2323	"	A. W. Livingston's Sons	98	7,484	7,334
2324	"	D. Landreth & Sons	76	7,428	5,645
2325	"	same	56	8,392	4,700
2326	"	Isaac F. Tillinghast.....	82	7,938	6,509
2327	"	James Vick	86	7,938	6,827
2328	"	Sam'l Wilson.....	58	7,995	4,637
2329	Berkshire Beauty.....	Benson, Maule & C'	92	8,221	7,563
2330	"	Isaac F. Tillinghast.....	94	8,618	8,101
2331	Early Drumhead Flat Dutch.....	David Landreth & Sons.....	42	6,294	2,643
2332	Early Market.....	same	62	7,258	4,500
2333	Advance	W. Atlee Burpee & Co.	88	8,051	7,085
2334	New, No. 1.....	same	90	8,675	7,807
2335	Burpee's No. 2	same	90	7,144	6,430
2336	Cannon Ball	Francis Brill.....	48	8,959	4,300
2337	Newark Early Flat Dutch.....	Benson, Maule & Co.	82	10,546	8,662
2338	Early Dwarf York.....	James Vick.....	86	7,314	6,290

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—.	Germinated—per cent.	Number of seed in ounce.	Number seed in one ounce that germinated.
CABBAGE—Continued.					
2339*	Very Early Etampes.....	Vilmorin, Andrieux et Cie.....	96	8,108	7,784
2340	“ “.....	Johnson & Stokes.....	86	6,804	5,851
RADISH.					
2018	Round Scarlet.....	A. W. Livingston's Sons.....	60	2,948	1,769
2019	Early Scarlet Erfurt.....	David Landreth & Sons.....	34	3,459	1,176
2020	Early Scarlet Turnip.....	A. W. Livingston's Sons.....	38	3,572	1,357
2021	“ “.....	David Landreth & Sons.....	32	3,005	962
2022	White-tipped Turnip.....	same.....	20	2,835	567
2023	“ “.....	A. W. Livingston's Sons.....	80	3,515	2,812
2024	Early Long Scarlet.....	same.....	50	2,344	1,172
2025	“ “.....	David Landreth & Sons.....	40	2,306	922
2026	Long Scarlet.....	same.....	12	2,268	272
2027	Sirap Long Scarlet.....	same.....	74	3,326	2,461
2028	Early Scarlet Prussian Globe.....	same.....	44	2,835	1,247
2029	Early White Turnip.....	A. W. Livingston's Sons.....	44	3,629	1,597
2030	Wood's Early Frame.....	same.....	34	2,533	861
2031	Early White Turnip.....	David Landreth & Sons.....	36	4,007	1,443
2032	Gray Summer Turnip.....	A. W. Livingston's Sons.....	66	2,986	1,971
2033	Yellow Summer.....	same.....	60	3,2 3	1,928
2034	Manmoth Summer.....	same.....	98	2,986	2,926
2035	Round Black Spanish.....	same.....	68	2,835	1,928
2036	Long “.....	.....	70	2,835	1,984

*Seed two years old.

2037	Scarlet China Winter.....	David Landreth & Sons.....	82	2,873	2,356
2038	Chinese Rose Winter.....	A. W. Livingston's Sons.....	74	2,986	2,210
2039	White Spanish.....	David Landreth & Sons.....	100	2,835	2,835
2040	California Mammoth.....	A. W. Livingston's Sons.....	54	2,948	1,592
2041	Dayton White.....	same.....	92	2,835	2,608
2042	".....	same.....	94	3,402	3,198
2043	Long White Naples.....	same.....	70	2,835	1,984
2044	French Breakfast.....	same.....	96	3,440	3,302
2045	Golden Globe.....	same.....	82	3,478	2,853
2046	".....	same.....	68	3,591	2,448
2047	Garnet Turnip.....	David Landreth & Sons.....	82	2,268	1,950
2048	White Lady Finger.....	A. W. Livingston's Sons.....	86	3,100	2,542
2049	Oliver Rose.....	David Landreth & Sons.....	72	3,704	2,667
2050	Grant Stuttgart.....	same.....	74	3,100	2,294
2051	Improved Chariots.....	same.....	88	2,684	2,362
2052	".....	same.....	96	2,570	2,467
LETTUCE.					
2053	New Perpetual.....	W. Atlee Burpee & Co.....	14	16,330	2,284
2054	Heat-resisting Cos.....	David Landreth & Sons.....	14	22,268	3,118
2055	".....	W. Atlee Burpee & Co.....	94	25,628	24,090
2059	Red Bessen.....	Jas. J. H. Gregory.....	86	32,659	28,087
2060	Bloomdale Butter.....	David Landreth & Sons.....	4	32,659	1,306
2061	Yellow-seeded Butter.....	W. Atlee Burpee & Co.....	100	22,680	22,680
2065	Improved White Tennis Ball.....	Jas. J. H. Gregory.....	90	30,391	27,352
2067	Black Tennis Ball.....	same.....	34	20,412	6,940
2068	Bloomdale Early Summer.....	David Landreth & Sons.....	100	22,226	22,226
2069	Bloomdale Reliable.....	same.....	92	28,123	25,873
2071	White-seeded Simpson.....	A. W. Livingston's Sons.....	100	17,464	17,464
2072	Black-seeded ".....	same.....	100	17,917	17,917
2073	Early Curled.....	W. Atlee Burpee & Co.....	90	18,824	16,942
2077	Royal Cabbage.....	David Landreth & Sons.....	100	23,814	23,814
2078	Philadelphia Early White Cabbage.....	W. Atlee Burpee & Co.....	94	24,494	23,024
2079	Speckled Dutch Butter.....	D. Landreth & Sons.....	100	20,866	20,866
2080	Salamander.....	A. W. Livingston's Sons.....	66	24,494	16,166
2082	Landreth's Forcing.....	D. Landreth & Sons.....	58	25,855	14,996
2083	Stonehead Golden Yellow.....	W. Atlee Burpee & Co.....	70	22,494	15,746
2085	Sugar Loaf.....	Jas. J. H. Gregory.....	8	19,278	1,532
2087	American Head.....	D. Landreth & Sons.....	98	18,144	17,781

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seed in ounce.	Number seed in ounce that germinated.
RADISH—Continued.					
2089	Earliest Cutling	D. Landreth & Sons	2	29,711	594
2090	Burpee's Golden Head	W. Atlee Burpee & Co.	81	23,587	19,813
2091	Hanson	Jas. J. H. Gregory	18	19,052	3,429
2092	Burpee's Silver Ball	W. Atlee Burpee & Co.	4	26,536	1,061
2093	Drumhead	same	0	21,319	0
2094	The Deacon	Jos. Harris	12	28,350	3,402
2341	Salamander	A. W. Livingston's Sons	92	22,962	21,125
ONTON.					
2096	Early Red	James Vick	4	7,258	290
2097	Large Red	D. M. Ferry & Co.	10	7,938	794
2098	Wethersfield	same	16	7,938	1,270
2099	"	Jas. J. H. Gregory	20	6,804	1,361
2100	"	James Vick	6	6,917	415
2101	Extra Early Red	David Landaeath & Sons	4	6,350	254
2102	Early Bermuda	Jas. J. H. Gregory	2	7,144	143
2103	Bermuda White	David Landreth & Sons	10	9,072	907
2104	White Silver Skin	A. W. Livingston's Sons	18	9,412	1,694
2105	"	same	16	7,938	1,270
2106	"	Peter Henderson & Co.	18	7,031	1,266
2107	Mammoth Silver King	A. W. Livingston's Sons	41	7,938	3,493
2108	"	Isaac F. Tillinghast	32	7,371	2,359
2109	er King	Benson, Maule & Co.	18	8,392	1,511

2110	Red Wethersfield.....	W. Atlee Burpee & Co.....	52	7,258	3,774
2111	" ".....	A. W. Livingston's Sons.....	6	6,804	408
2112	New Queen.....	James Vick.....	40	9,299	3,720
2113	Marzajola.....	D. Landreth & Sons.....	24	9,412	2,259
2114	Landreth's Golden.....	Jos. Harris.....	68	8,278	5,629
2115	Early Large Red.....	Isaac F. Tillinghast.....	28	7,258	2,032
2116	Mammoth Pompeii.....	A. W. Livingston's Sons.....	8	8,051	644
2117	Giant Rocca.....	Isaac F. Tillinghast.....	38	8,051	3,059
2118	Vesuvius.....	Peter Henderson & Co.....	58	7,711	4,472
2119	Stasburgh.....	A. W. Livingston's Sons.....	12	7,711	925
2120	Large Yellow Dutch.....	David Landreth & Sons.....	40	7,938	3,175
2121	Danvers Yellow.....	J. L. Green.....	6	10,093	606
2122	" ".....	David Landreth & Sons.....	52	7,145	3,715
2123	" ".....	I. E. Jones, Clintonville.....	26	7,711	2,005
2124	" ".....	A. W. Livingston's Sons.....	86	8,505	7,314
2125	" ".....	D. Landreth & Sons.....	48	7,938	3,810
2126	" ".....	Sam'l Wilson.....	4	7,598	304
2127	" ".....	Benson, Maule & Co.....	44	9,979	4,091
2128	" ".....	Hirman Sibley & Co.....	0	8,845	0
2129	" ".....	Johnson & Stokes.....	0	7,711	0
2130	" ".....	D. M. Ferry & Co.....	6	9,526	572
2131	" ".....	same.....	46	8,845	4,069
2132	" ".....	W. Atlee Burpee & Co.....	42	9,072	3,810
2133	Danvers Extra Yellow Globe.....	James Vick.....	42	7,938	3,334
2134	Danvers Yellow Globe.....	Peter Henderson & Co.....	42	8,845	3,715
2135	" ".....	Jas. J. H. Gregory.....	24	7,031	1,687
2136	" ".....	W. W. Rawson.....	26	7,988	2,064
2137	Danvers Extra Yellow Globe.....	Peter Henderson & Co.....	38	7,598	2,887
2138	Danvers Thick Yellow.....	W. W. Rawson.....	56	8,732	4,890
2139	Southport Yellow Globe.....	Peter Henderson & Co.....	36	8,051	2,898
2140	New White Globe.....	A. W. Livingston's Sons.....	14	7,031	984
2141	Red Globe.....	same.....	54	5,670	3,062
2142	White Globe.....	Peter Henderson & Co.....	4	7,031	281
2143	Southport White Globe.....	A. W. Livingston's Sons.....	18	6,804	1,225
2144	Danvers Yellow Globe.....	Hirman Sibley & Co.....	50	7,825	3,912
2145	" ".....		12	8,618	1,034

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seed in one ounce.	Number seed in one ounce that germinated.
TURNIP.					
2146	Early Flat Dutch Strap Leaved.....	.....	40	17,464	6,986
2147	Cowhorn.....	David Landreth & Sons	96	16,556	15,894
2148	Amber Globe Strap Leaved.....	same.....	98	17,396	17,336
2149	Yellow Aberdeen.....	same.....	88	12,928	11,377
2150	Yellow Stone.....	same.....	80	15,196	12,157
2151	Southern Snow White Globe.....	same.....	100	20,185	20,185
2152	Early Red Top Globe.....	same.....	100	13,381	13,381
2153	Early Flat Red Strap Leaved.....	same.....	98	14,742	14,447
2154	Early Bloomsdale Red Top.....	same.....	56	10,660	5,970
2155	Extra Early Purple Top Munich.....	Peter Henderson & Co.....	98	15,422	15,114
2156	.....	L. Reeve, Clerbrook, O	100	19,505	19,505
2157	Red Top Strap Leaved.....	Peter Henderson & Co.....	98	21,092	20,670
CAULIFLOWER.					
2175	Early Snowball.....	Hiram Sibley & Co.....	34	8,051	2,737
2176	".....	A. W. Livingston's Sons	70	6,350	4,445
2177	".....	W. Atlee Burpee & Co	40	6,804	2,722
2178	".....	Joseph Harris	68	8,392	5,707
2179	".....	same.....	82	8,392	6,881
2180	".....	D. M. Ferry & Co	72.2	8,051	5,813
2181	".....	Peter Henderson & Co	54	6,804	3,674
2182	".....	Benson, Maule & Co	40	7,938	3,175
2183	Extra Early, (No. 1).....	Francis Brill.....	26	7,598	1,975
2184	" (No. 2).....	same.....	16	8,732	1,397
2185	" (No. 3).....	same.....	60	8,505	5,103

2186	Early Erfurt	A. W. Livingston's Sons ..	22	7,711	1,696
2187	Extra Early Dwarf Erfurt.....	D. M. Ferry & Co ..	82	7,371	6,044
2188	"	W. Atlee Burpee & Co.....	38	9,072	3,447
2189	Early Dwarf Erfurt.....	James Vick.....	54	6,691	3,613
2190	"	Hiram Sibley & Co	36	9,185	3,307
2191	Dwarf Small Leaved.....	James Vick	52	6,577	3,420
2192	Half Early Paris	A. W. Livingston's Sons ..	30	10,319	3,096
2193	Walcheron.....	James Vick	70	8,392	5,874
2194	Asiatic.....	Joseph Harris	55.6	8,505	4,729
PEPPER.					
2195	Bell or Bull Nose.....	A. W. Livingston's Sons.....	36	3,969	1,429
2196	Golden Dawn	same.....	36	4,593	1,653
2197	Orange Mammoth	same.....	44	4,479	1,971
2198	Large Sweet Mountain	same.....	8	7,087	567
2199	Ruby King.....	same.....	72	3,912	2,817
2200	Mammoth Grossum	same.....	59	3,356	1,928
SALSIFY.					
2201	Scorzonera.....	David Landreth & Sons	0	2,838	0
2202	Common.....	same.....	56	2,778	1,556
2203	"	A. W. Livingston's Sons ..	82	2,251	1,846
2291	"	same	62.2	5,330	3,315
PARSNIP.					
2204	Hollow Crown	A. W. Livingston's Sons ..	10	5,557	556
2290	"	same.....	27.1	5,443	1,475
MUSTARD.					
2205	Large Leaved	David Landreth & Sons	42	12,247	5,144
TOMATO.					
1200	Acme.....	Ohio State University.....	87	.....	.....
2206	"	A. W. Livingston's Sons	96	8,959	8,601

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seed in one ounce.	Number seed in one ounce that germinated.
2207	LEEK. Carantan	David Landreth & Sons	4	9,752	390
2208	CRESS. Fine Curled	James Vick	48	14,855	7,130
2209	Plain Leaved	same	48	12,928	6,205
2210	EGG PLANT. N. Y. Purple	A. W. Livingston's Sons	8	7,484	599
2211	RUTA BAGA. Bloomsdale Swede	David Landreth & Sons	10	8,845	884
2212	Champion Swede (imported)	same	14	8,278	1,159
2214	OKRA. White Pod	David Landreth & Sons	90	482	434
2215	MELON—Citron. Acme	David Landreth & Sons	76	1,134	862

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seeds in quart.	Number seeds in one quart that germinated.
	BEAN.				
2216	Champion Bush.....	W. W. Rawson & Co., Boston, Mass.....	100	1,200	1,200
2217	“	A. W. Livingston's Sons	100	1,200	1,200
2218	Challenger Lima	W. Atlee Burpee & Co	75	870	660
2219	Dreer's Improved Lima.....	Peter Henderson & Co	52	960	510
2220	King of the Garden Lima.....	Frank S. Platt, New Haven, Conn.....	88	630	540
2221	Extra Early Lima	D. M. Ferry & Co.....	100	960	960
2222	Extra Early Red Valentine	David Landreth & Sons.....	100	2,130	2,130
2223	White Valentine	same.....	90	2,280	2,240
2224	Brown Speckled Valentine.....	same.....	42	2,880	1,200
2225	Red Valentine	Peter Henderson & Co	88	2,370	2,100
2226	Red Valentine	same.....	98	2,760	2,700
2227	First in Market.....	David Landreth & Sons	80	2,220	1,770
2228	Early Feejee	Peter Henderson & Co	100	1,950	1,950
2229	White Crease Back	D. M. Ferry & Co.....	88	3,780	3,330
2230	Goddard Bush	W. W. Rawson & Co.....	100	930	930
2231	Oval Red Speckled Cornfield.....	David Landreth & Sons	96	3,260	3,240
2232	Southern Prolific Pole	same.....	96	5,880	5,640
2233	Cream Seeded Out Shorts.....	same.....	96	2,280	2,190
2234	Wonder of France.....	Peter Henderson & Co	82	2,850	2,340
2235	Dwarf Mont D'Or	same.....	98	3,960	3,870
2236	Cleveland's Improved Valentine	A. W. Livingston's Sons	90	2,310	2,070
2237	Boston Market Favorite.....	same.....	96.7	960	930
2238	(A new Bean)	J. A. Everitt, Watontown, Pa.....	86	1,800	1,560
2239	Golden Refugee	Benson, Maule & Co.....	82	3,600	2,940
2240	Refugee	Peter Henderson & Co	78	2,730	2,130

SEED TESTS.—TABLE V.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seeds in one quart.	Number of seeds in one quart that germinated.
BEAN.—Continued.					
2241	Refugee.....	R. G. Crist, Newmarket, Ind.....	88.5	2,340	2,070
2242	New Golden Wax	Benson, Maule & Co.....	62	2,160	1,350
2243	Golden Wax	D. M. Ferry & Co	77.5	2,160	1,680
2244	Ivory Pod Wax	W. Atlee Burpee & Co	10	3,390	339
2245	Rhode Island Cream.....	D. M. Ferry & Co	100	1,920	1,920
2246	New Golden Wax	Benson, Maule & Co.....	48	2,100	1,020
2247	Landreth's Violet	David Landreth & Sons.....	54	1,860	990
2248	Improved Prolific Tree	Benson, Maule & Co.....	66	3,400	2,500
2249	Improved Prolific Tree	E. S. T. agarden, Davenport, Iowa.....	58	4,260	2,460
2250	Landreth's Scarlet.....	David Landreth & Sons.....	85	1,980	1,680
2251	Green Gem	Benson, Maule & Co.....	57.1	3,390	1,950
2252	Green Gem	R. G. Crist	90	2,820	2,550
2253	Kentucky Wonder	D. M. Ferry & Co	95.6	2,280	2,190
2254	Colorado Dwarf Bush	Samuel Wilson	88	3,150	2,760
2255	Flageolet (New variety).....	Rural New Yorker.....	100	2,940	2,940
2256	Green Gem	W. Atlee Burpee & Co.....	97.1	3,120	3,030
PEA.					
2257	First and Best.....	Hiram Sibley & Co.....	98	3,960	3,870
2258	Philadelphia Extra Early	same.....	72	4,140	2,970
2259	Philadelphia Extra Early	Johnson & Stokes.....	61	4,200	2,550
2260	First and Best.....	.....	66	3,900	2,580
2261	First and Best.....	D. M. Ferry & Co	82	3,750	3,060
2262	First and Best.....	W. W. Rawson & Co	86	4,320	3,720
2263	Philadelphia Extra Early	W. Atlee Burpee & Co	72	4,140	2,970

2264	Benson, Maule & Co.'s Extra Early	Benson, Maule & Co.	74	4,020	2,970
2265	Burpee's Extra Early	W. Atle ² Burpee & Co	68	5,100	3,480
2266	Vick's Extra Early	James Vick.	92	3,240	2,971
2267	Extra Early Reliance	J. A. Everitt	54	3,630	1,950
2268	Extra Early Tom Thumb	D. M. Ferry & Co	60	4,200	2,520
2269	Everitt's Early	J. C. Everitt, Lima, Ind.	56	3,900	2,160
2270	Rawson's Seventeenth of June.	W. W. Rawson & Co	60	3,810	2,280
2271	Mark t Garden.	Horsford & Pringle, Charlotte, Vt.	84	3,900	3,270
2272	Excelstor	C. E. Allen, Brattleboro, Vt.	72	3,810	2,730
2273	Early Daniel O'Rourke	W. W. Rawson & Co	78	3,870	3,030
2274	Carter's Premium Gem	Jas. J. H. Gregory	40	3,570	1,440
2275	Maule's Family Gem	Benson, Maule & Co	56	4,140	4,200
2276	Dwarf Gray Sugar	A. W. Livingston's Sons	74	5,670	4,200
2277	Tom Thumb	D. M. Ferry & Co	84	4,380	3,690
2278	Dwarf Champion of England	Jas. J. H. Gregory	82	2,070	1,710
2279	Yorkshire Hero	A. W. Livingston's Sons	2	2,430	60
2280	Carter's Little Wonder	D. M. Ferry & Co	8	2,580	210
2281	Yorkshire Hero	David Landreth & Sons	0	2,520	0
2282	Garden Pride	J. C. Everitt	68	3,990	270

COMMISSION SEEDS.

The results of the tests made in 1884 of the vitality of seeds purchased from commission men, compared with those from prominent seedsmen direct, showed that there was a difference, the former giving the lowest per cent. of germination in nearly every instance. During the spring of 1885 this investigation was continued, and a much larger number of samples tested than the previous year. The results agree pretty generally with those of last year. The commission seeds were purchased from several grocers in Columbus, O., and represent three different seed houses.

Table VI. gives the full list of these tests for 1885, showing the recorded number of the test, the name of each variety and of the seedsman by whom it was put up, the per cent. that germinated, the number of seeds in one ounce and the number of seeds that would sprout from one ounce at the rate of germination in the test.

In the tests of cabbage seed the smallest number of sprouted seeds was from a packet of Improved Early Drumhead, No. 1881, from D. M. Ferry & Co., and another of Early Dwarf Flat Dutch, No. 1883, from Hiram Sibley & Co., 6 per cent. of each having germinated. The highest germination was only 88 per cent., from a packet of Early Dwarf Flat Dutch, No. 1882, from D. M. Ferry & Co. There is not so great a difference between the poorest and the best as in the seeds direct from the seedsmen, but the tests cover only about one eighth as many samples as the latter. The average for the nineteen tests was 40.74 per cent., only a little more than half that of cabbage seeds direct from seedsmen.

In no instance did 90 per cent. or above germinate, while in those from seedsmen direct one-third of the tests gave germinations this high. In two, or a little more than 11 per cent. of the tests, the germination was higher than 75 per cent. as compared with nearly 74 per cent. of the tests of cabbage seed from seedsmen direct. In more than two thirds of the tests there were less than 50 per cent. germinated.

The tests of onion seeds were very unsatisfactory. However, better results were obtained from commission seed than from seed direct from the seedsmen. The reason for this is not evident.

In the tests of radish seeds there was a greater difference between the seed from grocers and from seedsmen than was found in the cabbage seeds. The average of the seed from grocers was only 24 per cent. sprouted; but of those from seedsmen nearly 65 per cent. sprouted.

SEED TESTS.—TABLE VI.—COMMISSION SEEDS PURCHASED FROM GROCERS.

Test number.	Variety.	Put up by—	Germinated—per cent.	Number of seeds in one ounce.	Number seeds in one ounce that germinated.
CABBAGE.					
1878	Henderson's Early Summer.....	Jerome B. Rice & Co., Cambridge, N. Y.	70	7,031	4,922
1879	Early Market	D. M. Ferry & Co., Detroit, Mich.	20	7,938	1,588
1880	Early Drumhead	Hiram Sibley & Co., Rochester, N. Y.	28	8,505	2,381
1881	Improved Early Drumhead	D. M. Ferry & Co.	6	8,505	510
1882	Early Dwarf Flat Dutch	same	88	7,938	6,985
1883	"	Hiram Sibley & Co.	6	9,866	592
1884	Early York	same	28	8,335	2,334
1885	"	D. M. Ferry & Co.	42	8,959	3,763
1886	Early Winningstadt	same	84	8,505	7,144
1887	"	Jerome B. Rice & Co.	44	7,959	3,502
1888	"	Hiram Sibley & Co.	28	7,484	2,096
1948	Large Late Flat Dutch	same	8	7,484	599
1949	"	D. M. Ferry & Co.	74	7,598	5,623
1950	Premium Large Drumhead	same	70	7,484	5,239
1951	"	same	46	6,917	3,182
1952	Improved American Savoy	same	26	8,165	2,143
1953	Marblehead Mammoth Drumhead	same	22	6,917	1,542
1954	Large Late Drumhead	same	16	8,618	1,379
1955	"	Hiram Sibley & Co.	68	8,732	5,938
TOMATO.					
1956	Perfection	Jerome B. Rice & Co.	40	10,886	4,354
1957	"	D. M. Ferry & Co.	74	8,732	6,462
1958	Hathaway's Excelsior	Hiram Sibley & Co.	2	8,959	179
1959	"	D. M. Ferry & Co.	12	9,299	1,115

SEED TESTS.—TABLE VI.—Continued.

Test number.	Variety.	Put up by—	Germinated—per cent.	Number of seeds in one ounce.	Number seeds in one ounce that germinated.
TOMATO.—Continued.					
1960	Early Conqueror	D. M. Ferry & Co.....	52	9,072	4,717
1961	Red Trophy	Hiram Sibley & Co.....	70	8,845	6,191
1962	Early Acme.....	same.....	72	9,299	6,695
1963	Large Red	D. M. Ferry & Co.....	36	9,412	3,388
1964	Large Smooth Red	same.....	90	9,412	8,471
1965	Acme.....	same.....	58	9,979	5,788
1966	Trophy	same.....	50	9,649	4,824
1967	Canada Victor.....	same.....	56	10,093	5,652
1968	Paragon	same.....	78	9,526	7,430
TURNIP.					
1969	Early Purple Top Strap Leaved	D. M. Ferry & Co.....	88	18,257	16,066
1970	“	Hiram Sibley & Co.....	42	12,928	5,430
1971	Early White Flat Dutch	same.....	28	13,721	3,842
1972	“	D. M. Ferry & Co.....	94	15,763	14,817
1973	Red Top Flat Norfolk	same.....	52	12,928	6,723
1974	Purple Top Yellow Aberdeen.....	Jerome B. Rice & Co.....	2	12,928	259
1975	Yellow Stone	same.....	88	14,288	12,573
1976	Early Red Top Strap Leaved.....	same.....	94	18,257	17,162
ONION.					
1977	Large Red Wethersfield	Jerome B. Rice & Co.....	54	8,165	4,409
1978	“	D. M. Ferry & Co.....	66	7,825	5,164
1979	“	same.....	82	7,825	6,416

1980	"	Hiram Sibley & Co.....	0	7,938	0
1981	Early Red.....	D. M. Ferry & Co.....	34	7,938	2,699
1982	Yellow Danvers.....	Jerome B. Rice & Co.....	50	8,392	4,196
1983	"	Hiram Sibley & Co.....	32	8,845	2,830
1984	"	D. M. Ferry & Co.....	44	8,959	3,942
1985	White Silver Skin	Hiram Sibley & Co.....	18	8,165	1,470
1986	"	D. M. Ferry & Co.....	32	8,392	2,685
CUCUMBER.					
1987	Early Frame.....	Jerome B. Rice & Co.....	70	1,179	825
1988	Early Cluster.....	same.....	68	1,021	694
1989	"	D. M. Ferry & Co.....	82	975	799
1990	"	Hiram Sibley & Co.....	46	1,157	532
1991	Early Frame	same.....	28	1,043	292
1992	"	D. M. Ferry & Co.....	48	1,043	501
CARROT.					
1993	New Danvers	Jerome B. Rice & Co.....	54	12,928	6,981
1994	Early Scarlet Stump Rooted	D. M. Ferry & Co.....	54	14,742	7,961
1995	Half Long	Hiram Sibley & Co.....	26	13,948	3,626
1996	Improved Long Orange	D. M. Ferry & Co.....	26	11,453	2,978
1997	Early Scarlet Horn	same.....	38	13,608	5,171
CAULIFLOWER.					
1998	Walcheron.....	Hiram Sibley & Co.....	28	7,371	2,064
1999	Henderson's Early Snowball	Jerome B. Rice & Co.....	78	6,691	5,219
2000	Early Erfurt	D. M. Ferry & Co.....	50	9,866	4,933
2001	True Erfurt	Hiram Sibley & Co.....	20	9,299	1,860
RADISH.					
2002	Early Long Scarlet	Hiram Sibley & Co.....	16	2,013	322
2003	Early Scarlet Turnip.....	same.....	0	2,948	0
2004	Chinese Rose	same.....	0	3,600	0
2005	"	D. M. Ferry & Co.....	92	3,062	2,817
2006	New French Breakfast.....	Hiram Sibley & Co.....	12	3,487	418

SEED TESTS.—TABLE VI.—Continued.

Test number.	Variety.	From—	Germinated—per cent.	Number of seed in ounce.	Number of seed in one ounce that germinated.
	EGG PLANT.				
2007	N. Y. Round Purple.....	Hiram Sibley & Co.....	6	7,258	435
2008	Large Purple.....	D. M. Ferry & Co.....	10	7,371	737
	PARSNIP.				
2009	Hollow Crown.....	D. M. Ferry & Co.....	32	6,350	2,032
	PEPPER.				
2010	Bull Nose.....	D. M. Ferry & Co.....	54	4,196	2,266
2011	".....	Hiram Sibley & Co.....	18	4,763	857
	LETTUCE.				
2012	Simpson's Early Curled.....	D. M. Ferry & Co.....	82	18,371	15,064
	SQUASH.				
2013	Early Bush Scallop.....	Hiram Sibley & Co.....	74	331	245

MELON—WATER.					
2014	Mountain Sweet.....	Jerome B. Rice & Co.....	46	291	134
2015	".....	Hiram Sibley & Co.....	64	255	163
2016	".....	D. M. Ferry & Co.....	86	276	237
MELON—MUSK.					
2017	Rice's Surprise.....	Jerome B. Rice & Co.....	74	1,115	825

SEEDS DIRECT FROM SEEDSMEN VERSUS SEEDS FROM COMMISSION MEN.

In order to show the average vitality of the various kinds of seeds tested, and to compare the average germination of seeds from seedsmen direct with those from commission men, the following table (Table VII) has been compiled from the two just preceding. In this table are included all varieties of seed, purchased for fresh, of which two or more tests were made of each kind. Here is shown the number of germinations made, the average per cent. that germinated and the average number of seeds contained in one ounce, of both seeds from commission men and from seedsmen direct.

In every instance except one, where a large number of tests of one kind were made, a higher per cent. of germination was procured from seeds direct from seedsmen than from those procured from commission men.

TABLE VIII.

As there is a difference in the vitality of different varieties of the same kind of seed, even when grown, harvested, cured and stored under the same conditions, varieties from one source should be compared with the same varieties from the other source. Table VIII. compares the same varieties in this manner. Of the six varieties of cabbage compared in the table, five show a higher vitality where procured from the seedsmen direct, than where procured of commission men. But of the four varieties of onion, every one shows a better germination of seed from grocers than from seedsmen direct. In nearly every other instance the result is in favor of seeds procured direct from seedsmen.

In the second column from the right, in this table, is given the difference in germination of the seeds from the two sources. When the sign minus (—) is placed before the number, the seeds from commission men produced the best germination, by the amount indicated by the number. The sign plus (+) shows the greater germination to have been produced by seeds from seedsmen direct.

In the last column on the right, minus (—) indicates a greater number of seeds per ounce of those from commission men; plus (+) indicates a greater number per ounce of those from seedsmen.

TABLE IX.

That any difference in the quality of the same varieties of seeds from different seedsmen may not be thought the source of difference in results, the same varieties put up by the same seedsmen and procured from both sources are placed for comparison in Table IX. It will be observed that the results do not differ materially from those obtained by comparing the same varieties from several seedsmen, as given in Table VIII.

SEED TESTS.—TABLE VII.—AVERAGE GERMINATION OF DIFFERENT VARIETIES AND COMPARISON OF COMMISSION SEEDS WITH THOSE FROM SEEDSMEN DIRECT.

Variety.	Seeds from commissionmen.			Seeds from seedsmen.		
	Number of tests.	Average per cent. germinated.	Average number of seeds in one ounce.	Number of tests.	Average per cent. germinated.	Average number of seeds in one ounce.
Cabbage	19	40.74	8,049	156	78.90	7,737
Radish	5	24.00	3,022	35	64.86	3,034
Cauliflower	4	44.00	8,307	20	50.09	7,972
Lettuce	1	82.00	15,064	28	61.57	23,519
Turnip	8	61.00	14,884	12	87.67	16,235
Union	10	41.20	8,244	50	27.36	7,947
Tomato	13	53.08	9,474	2	91.50	.....
Pepper	2	36.00	4,479	6	41.00	4,649
Egg Plant	2	8.00	7,214	1	8.00	7,484
Parsnip	1	32.00	6,350	2	18.55	5,500
Carrot	5	39.60	13,336	.....	.....	.....
Melon—water	3	65.33	274	.....	.....	.....
“ musk	1	76.00	1,115	.....	.....	.....
Bean .....	.....	.....	.....	1	76.00	1,134
Pea .....	.....	.....	.....	41	82.40	82
Salsify .....	.....	.....	.....	26	63.42	127
Cress .....	.....	.....	.....	4	50.00	3,199
Ruta Baga .....	.....	.....	.....	2	48.00	13,891
.....	.....	.....	.....	2	12.00	8,561

SEED TESTS.—TABLE VIII.—COMPARISON OF AVERAGE GERMINATION OF ALL TESTS OF SAME VARIETIES FROM COMMISSION MEN AND DIFFERENT SEEDSMEN.

Variety.	From commission men.			Direct from seedsmen.			Difference in per cent. germinated, increase or decrease, + or —.	Difference in number of seeds in one ounce, increase or decrease, + or —.
	Number of packets tested.	Average per cent. germinated.	Average number of seeds in one ounce.	Number of packets tested.	Average per cent. germinated.	Average number of seeds in one ounce.		
CABBAGE.								
Henderson's Early Summer.....	1	70.0	7,031	14	59.0	7,939	—11.0	+ 908
Early Winningstadt.....	2	56.0	8,232	4	87.0	9,355	+31.0	+1123
Marble-head Mammoth Drumhead.....	1	22.0	6,917	4	74.4	7,881	+52.5	+ 964
Late Flat Dutch.....	2	41.0	7,541	4	87.5	7,261	+46.5	— 280
Early Flat Dutch.....	2	47.0	8,924	4	86.0	7,450	+39.0	— 474
Early York.....	2	35.0	8,647	1	86.0	7,314	+51.0	—1333
TOMATO.								
Acme.....	1	50.0	9,649	2	91.5	.....	+41.5	.....
RADISH.								
Chinese Rose Winter.....	2	46.0	3,331	1	74.0	2,986	+28.0	— 345
Early Scarlet Turnip.....	1	0.0	2,948	2	35.0	3,288	+35.0	+ 340
Early Long Scarlet.....	1	16.0	2,013	3	34.0	2,325	+18.0	+ 312
French Breakfast.....	1	12.0	3,487	1	96.0	3,440	+84.0	— 47
TURNIP.								
Yellow Aberdeen.....	1	2.0	12,928	1	88.0	12,928	+86.0	0
Early Red Top Strap-Leaved.....	1	94.0	18,251	1	98.0	14,742	+ 4.0	—3515

ONION.

Early Red.....	1	34.0	7,938	2	4.0	6,804	-30.0	-1134
Large Red Wethersfield.....	4	50.5	7,928	6	18.3	7,276	-32.2	- 652
Yellow Danvers.....	3	42.0	8,398	12	30.0	8,531	-12.0	+ 133
White Silver Skin.....	2	25.0	8,278	3	17.3	8,127	- 7.5	- 151

CAULIFLOWER.

Early Snowball.....	1	78.0	6,691	8	57.3	7,598	-20.5	+ 907
Early Erfurt.....	2	35.0	9,582	5	46.5	8,006	+11.5	-1576

EGG PLANT.

New York Purple.....	1	6.0	7,258	1	8.0	7,484	+ 2.0	+ 226
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PEPPER.

Bell or Bull Nose.....	2	36.0	4,479	1	36.0	3,969	0	- 510
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PARSNIP.

Hollow Crown.....	1	32.0	6,350	2	15.0	5,500	-17.0	- 850
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SEED TESTS.—TABLE IX.—COMPARING SAME VARIETIES FROM COMMISSION MEN AND FROM SEEDSMEN DIRECT,
BUT PUT UP BY THE SAME SEEDSMEN.

Variety.	Put up by—	Commission.		Direct.	
		Germi- nated— per cent.	Number seeds per ounce.	Germi- nated— per cent.	Number seeds per ounce.
CABBAGE.					
Large Late Flat Dutch	Hiram Sibley & Co.	8	7,484	86	7,484
Premium Large Drumhead *	D. M. Ferry & Co.	58	7,200	88	8,392
Improved American Savoy	same.....	26	8,165	86	12,928
Marblehead Mammoth Drumhead	same.....	22	6,917	70	9,412
ONION.					
Large Red Wethersfield †	D. M. Ferry & Co.	74	7,825	13	7,938
Yellow Danvers	same.....	44	8,959	42	9,072
Yellow Danvers	Hiram Sibley & Co.	32	8,845	6	9,526

* Two packets from commission men and one from seedsmen.

† Two packets from commission men and two from seedsmen.

NEW AND OLD LETTUCE SEED.

Several packets of Lettuce seed that were tested in 1884 were tested again in 1885. The results of these tests are given in Table X.

In this table the weight of the seed or number of seeds in one ounce is given, and the per cent. that germinated in 1884 and in 1885 in parallel columns for comparison; also the number of seeds in one ounce that would germinate, estimated from the weight of the seed in 1885 and the per cents. that germinated in 1884 and 1885. There is no uniformity in the results, the per cent. of sprouted seed being higher in 1884 than in 1885 in many cases, while in others the reverse is true. The average of the sixteen tests for 1884 was 53.25 per cent. of germinated seed, and for 1885 only 45.50 per cent., a difference of 7.75 in the per cent. germinated.

SEED TESTS.—TABLE X.—LETTUCE GERMINATED IN 1884 AND 1885.

Test number.	Variety.	From—	Germinated —per cent.		Number seeds in one ounce.	Number seeds germinated in one ounce.	
			1884.	1885.		1884.	1885.
2056	Monstrous Crown Cos	Vilmorin, Andrieux et Cie	76	84	27,443	20,857	23,052
2057	White Paris Cos	same	64	86	39,690	25,402	34,133
1058	Red Besson	same	62	78	25,402	16,749	19,814
2002	Turkish or Butter	same	32	74	27,443	8,782	20,308
2003	Stone Tennis Ball	same	22	6	27,443	6,037	1,647
2004	White Tennis Ball	same	18	20	27,896	5,021	5,579
2006	White Tennis Ball	Peter Henderson & Co	92	86	27,216	25,039	23,406
2070	Bloomsdale Reliable	D. Landreth & Sons	68	98	27,896	18,969	27,348
2074	Hammersmith	Vilmorin, Andrieux et Cie	40	46	32,432	12,973	14,919
2075	Brown Winter Cabbage	same	86	66	32,432	27,892	21,405
2076	Neapolitan Cabbage	same	14	2	26,082	3,651	1,225
2081	Landreth's Forcing	D. Landreth & Sons	12	6	20,412	2,449	0
2084	White Batavian	Vilmorin, Andrieux et Cie	42	0	22,680	9,526	8,877
2086	Large White Stone	same	76	38	23,360	8,877	4,123
2088	Brown Geneva	same	60	18	22,906	13,744	5,670
2095	The Deacon	Joseph Harris	88	20	28,350	24,948	

IMPURITIES IN SEEDS.

The value of seeds for planting deteriorates in a geometric ratio with the quantity of impurities they contain. Not only is it necessary that, to fill their purpose, seeds shall grow when planted under favorable conditions, but also that they shall be what they purport to be, and nothing else. In sowing wheat or grass the ground should not be seeded with cockle or plantain or other foul weeds.

There has been a complaint of long standing against the method of the Department of Agriculture at Washington, D. C., of sending out seeds; that in these distributions seeds of pernicious weeds have been scattered over the farms of the United States, and into regions where they were before unknown. With a view towards determining the character and quantity of impurities in the wheat distributed by the Department, several packages were carefully examined, and the impurities removed and weighed. From these examinations it appears that the amount of impurities with the wheat have been thought much greater than the examinations reveal. On the other hand the character of the impurities in the form of foreign seeds (*i. e.*, other than wheat) is bad enough, although not of as great variety as might be expected.

Just what besides wheat the packages contained, and the exact amounts of the various impurities are shown below. The number of seeds of each species in one bushel of wheat—calculated from the number found in one quart—is given after the name of the seed. The quantity of each kind of the impurities is given in decimals of one per cent.

The greatest total amount of impurities found in any one sample of wheat was less than .5 of 1 per cent.; the least found was a little more than .02 of 1 per cent.; the average for the eight samples, less than .16 of 1 per cent.

Packages of one quart each were examined. The package of Michigan Amber was sent out from the Department in 1884; the others were sent out in 1885. The greatest amount of impurities was found in the wheat distributed in 1884, which may be taken as indicating that an effort is being made to secure better seeds for distribution.

I. MICHIGAN AMBER—1884.

	Decimal parts of 1 per cent.
Chaff from wheat.....	.0758
Chess (<i>Bromus secalinus</i>) 9,248 seeds.....	.2777
Cockle (<i>Lychnis githago</i>) 1,888 seeds.....	.0609
Oat (<i>Avena sativa</i>) 160 seeds.....	.0117
Barley (<i>Hordeum vulgare</i>) 32 seeds.....	.0040
Sow Thistle (<i>Sonchus</i>) 32 seeds.....	.0001
Earth and dust.....	.0254
Total impurities.....	.4556

II. GENOESE—1885.

Chaff from wheat.....	.0108
Oat (<i>Avena sativa</i>) and barley (<i>Hordeum</i>) 32 seeds each.....	.0053
Fragments of stone.....	.0081
Total impurities.....	.0242

III. INDIAN—1885.

Miscellaneous seeds.....	.0135
Chaff from wheat, dust and dirt.....	.0353
Total impurities.....	.0488

IV. MARTIN'S AMBER—1885.

	Decimal parts of 1 per cent.
Chaff and joints of straw from wheat.....	.0111
Chess (<i>Bromus secalinus</i>) 252 seeds.....	.0080
Cockle (<i>Lychnis githago</i>) 512 seeds.....	.0180
Oat (<i>Avena sativa</i>) 128 seeds.....	.0116
Rye (<i>Secale cereale</i>) 32 seeds.....	.0020
Garlic (<i>Allium vineale</i>) 192 bulblets .....	.0183
Dust, pieces of weed stems .....	.0166
Two specimens, not determined, 64 seeds .....	.0009
Total impurities.....	.0865

V. EXTRA EARLY OAKLEY—1885.

Dust, chaff and crushed seeds (32) .....	.0081
Garlic (<i>Allium vineale</i>) 704 bulblets.....	.0374
Total impurities.....	.0455

VI. MCGHEE'S WHITE—1885.

Chaff from wheat.....	.0074
Cockle (<i>Lychnis githago</i>) 576 seeds.....	.0273
Oat (<i>Avena sativa</i>) 32 seeds.....	.0047
Garlic (<i>Allium vineale</i>) 160 bulblets.....	.0073
Dust, sand, etc.....	.0261
Smutted wheat, 640 kernels.....	.0192
Not determined, 704 seeds.....	.0474
Not determined, 160 seeds.....	.0120
Total impurities.....	.1514

VII. DIEHL—MEDITERRANEAN—1885.

Chaff from wheat.....	.0018
Chess (<i>Bromus secalinus</i>) 352 seeds.....	.0108
Rye (<i>Secale cereale</i>) 256 seeds.....	.0186
Not determined.....	.0046
Dust and sand .....	.0012
Total impurities.....	.0370

VIII. DIEHL—MEDITERRANEAN (Houghton Farm)—1885.

Chaff, pieces of straw and weeds.....	.0289
Chess (<i>Bromus secalinus</i>) 3,360 seeds .....	.1126
Oat (<i>Avena sativa</i>) 480 seeds.....	.0511
Rye (<i>Secale cereale</i>) 1,824 seeds .....	.1752
Cockle and several species of <i>Polygonaceae</i> .....	.0055
Dust and sand .....	.0185
Total impurities.....	.3918

An examination of the above tables will impress one with the fact that a very large number of foreign seeds may be present in wheat, and yet constitute but a very small per cent. of impurities. Thus, in Sample I. it is shown that seed of Chess or Cheat (*Bromus secalinus*) may be in wheat to the extent of 9,000 per bushel, but make less than .2 of 1 per cent. Cockle (*Lychnis githago*) at the rate of 2,000 seeds per bushel, makes but a little more than .06 of 1 per cent of foreign seeds. It would take 320,000 seeds of Sow Thistle (*Sonchus*) to make 1 per cent of impurities in a bushel of wheat. From Sample VIII. it may be seen that rye or oats in wheat at the rate of 1,000 seeds per bushel would constitute but about .1 of 1 per cent. of impurities.

REPORT ON INSECTS.

In previous reports quite full descriptive notes have been given of the more common insects injurious to farm and garden crops, together with a discussion of the practical remedies for the same.

During the past year special observations have been made regarding the best methods of using certain well known insecticide substances, and the efficiency of different mechanical contrivances for this purpose, has been thoroughly tested.

NOTES OF THE YEAR.

Under this general head will be given brief notes and observations made the past season on such insects as have already been described.

THE CURRANT WORM (*Nematus ventricosus*.)

For this troublesome and persistent enemy white hellebore was used. The first application was made May 14th, followed by others from time to time, until the last of June. As a rule the applications were made about one week apart, although the intervals depended to some extent upon the character of the weather.

In all, six applications were made. It required one and one-half hours for one man to go over one-half acre of currants and gooseberries each time. The hellebore was applied by means of a bellows. Several patterns were tested, that of Woodason giving the best results. By means of this contrivance the poison was finely divided and economically distributed. The bellows is the invention of Thomas Woodason, Chicago.

Kerosene emulsion had no perceptible effect upon the currant worm, but injured the leaves of the bushes to some extent.

THE CANKER WORM (*Anisopteryx vernata*.)

The following letter came to the Station May 19th:

ATHENS, O., May 17, 1885.

Prof. William R. Lazenby:

DEAR SIR: The canker worms have again made their appearance in my apple orchard. According to your former instruction I plowed up the ground in the winter of '83 and hand grubbed around the trees. The following spring a few insects made their appearance. I sprinkled the trees with a wash, although I thought there were so few worms they would do no harm. Now the worms are very numerous. Can you not send me a pump and hose to sprinkle the whole trees?

If you can not send me some remedy they will destroy my orchard and then spread over the whole county.

They are just commencing their depredations and will continue from ten to fifteen days. If I get no relief my orchard must go. It contains fifteen acres of fine fruit trees.

Yours respectfully,
ISAAC RADFORD.

In response to this letter Mr. W. B. Alwood, of the Station, was immediately sent to investigate the matter and see what could be done. He arrived at Mr. Radford's May 20th and found the orchard, a fine one of about 800 trees, badly infested. The trees were literally alive with worms, there being scarcely a leaf free from them. Mr. Alwood took with him an ordinary double action spray pump, a quantity of Paris green, London purple, and material for making a kerosene emulsion.

An emulsion consisting of kerosene, whale oil soap and water, according to the formula published by Prof. Riley, was prepared. This was diluted with twenty times its bulk of water and applied immediately by means of the force pump.

The pump had a discharge hose 12 feet in length, fitted with a cyclone nozzle. This was fastened to a stout pole so that it could be elevated, and thus cause a fine spray to reach every part of the trees. The diluted kerosene emulsion was put into a barrel which was mounted on a wagon.

One man drove and worked the pump, another one handled the nozzle. In this way the work was done quite rapidly, the wagon being driven between the rows of trees, one-half of each row being sprayed in its passage. Instructions were given to thoroughly perform this work and if it did not prove effectual to apply a solution of Paris green, at the rate of one pound to every gallons of water. In a few days thereafter Mr. Radford wrote as follows:

"The spraying of the trees with kerosene and soap did not seem to be very effective. I waited about thirty hours after the application and could not see much diminution of the worms. I then hastily sprayed the trees with the Paris green, making the solution as recommended.

"Upon a few rows I used London purple in the same manner.

"To my great surprise and delight, in twenty hours there were but few worms to be seen, and in thirty-six hours, strange as it may appear, there was not one to be found.

"The neighbors say it was the most magical thing they ever saw, for they have seen the orchard denuded each season for the past three or four years.

"In conclusion, I must say that I have not language to express my gratitude to you and the Station, through whose energies my orchards have been saved."

In the First Annual Report of the Station, a full description of the canker worm is given, and the following remedial measures are recommended:

As the female moth cannot fly, and is obliged to crawl up the tree in order to deposit her eggs where they will work injury, it is evident that if her passage be obstructed, the tree will be saved. How to place a cheap and effective barrier about the tree is the problem to solve. Probably the best substance by which this purpose can be effected is tar. Paper bands about eight inches wide should be tacked around the tree close to the ground. A circle of tar should be smeared around these, which must be renewed as rapidly as it becomes dry. Some have used cheap molasses and printer's ink with good results. If one has many trees to protect, a cheaper and better remedy is to syringe or sprinkle them with a solution of Paris green or London purple, just as has been described for the codling moth. Shaking the worms from the tree upon a light coat of straw, which is immediately burned, is a remedy practiced with good results in some places. Something may be done in the way of lessening the number of the pests by plowing or digging up the ground about the trees just before the frost comes. By so doing many of the pupa are exposed and killed for want of protection. Hogs will help to turn and overturn the soil, especially if pains be taken to scatter a little corn through it.

It will be seen from the experience of Mr. Radford that where preventive measures have been neglected, and the eggs of the canker worm permitted to hatch, that the Paris green remedy can be effectually employed.

It is more than probable, however, that here as well as elsewhere, "Prevention is better than cure."

PLUM CURCULIO (*Conotrachelus nenuphar.*)

Several applications of kerosene emulsion were made to plum trees after it was seen that the fruit was stung by the curculio. This treatment had no effect as all of the fruit dropped. A solution of Paris green used in the same way gave equally unsatisfactory results. Had these remedial agents been applied at an earlier date, the effect might have been different.

POTATO BEETLE (*Doryphora 10 lineata.*)

This well known pest was quite thoroughly destroyed by using one teaspoonful of Paris green to every ten quarts of water.

The Paris green must be of good quality, or a solution of the strength named above will not prove satisfactory.

Kerosene emulsion was thoroughly applied as a remedy for the potato beetle, but it had no apparent effect. The emulsion was diluted twenty times, which was about as strong as could be safely used.

CABBAGE WORM (*Pieris rapæ.*)

This enemy maintains its ground well, and proved very troublesome the past season.

A large number of remedies were tried. The following experiments are briefly reported:

Experiments 1-5.—Dry bran, salt (both coarse and fine), lime, sulphur, and white hellebore were thoroughly applied at different times and under various conditions. None of them proved effective.

Experiment 6.—One pound of whale oil soap boiled in one gallon of water, and diluted with three times its bulk of water, was applied with a spray pump. Several applications were made. Many of the worms were killed, but enough remained to seriously injure the crop. This remedy, although safe cannot be recommended as a specific. Preparing the solution sometime before using, and allowing it to become more or less putrid increases its efficiency.

Experiment 7.—Ice water was thoroughly tested. It was applied at different times, but as a rule, did little or no good. When applied during the hottest portion of the day it dislodged some of the worms that happened to be on the outer leaves, but failed to have any lasting effect upon those more in the center of the plant. Worms were seen to rapidly recover after being completely immersed for several seconds in ice water.

Experiment 8.—One half ounce of pyrethrum to 15 quarts of water, applied with a spray pump, having a cyclone nozzle, proved an almost perfect remedy. Only one application was made. Although a few worms appeared subsequently they were not in sufficient number to do any special injury.

Experiment 10.—Used in the form of powder, with a small bellows, one ounce of pyrethrum proved sufficient for 150 cabbages. Twelve hours after this application was made, a careful examination showed that no live worms could be found. No further application as found necessary.

Experiment 11.—One ounce of pyrethrum and one ounce of fine air-slaked

lime were thoroughly mixed. This mixture was applied in the same manner and same quantity as noted in Experiment 10. The results were equally satisfactory, and the application less expensive.

Experiment 12.—One ounce of pyrethrum with four ounces of buckwheat flour was found to be very efficient. The mixture was carefully made and applied with the Woodason bellows. The work was done very rapidly, one man being able to thoroughly sprinkle, at the rate of three acres of cabbages per day. This was the most practical remedy tried, being effectual, cheap, easy of application and harmless to the plant.

Experiment 13.—One part of Paris green thoroughly mixed with twenty parts of fine slaked lime was nearly as effective as pyrethrum. This was applied August 14, before the cabbages had begun to form heads. Although it proved effectual, the danger of using Paris green upon any food plant makes it a remedy that cannot be strongly recommended. When used at all, great caution must be exercised.

Experiment 14.—Kerosene emulsions of various strength were carefully tested. The results were unsatisfactory. Equal parts of kerosene and water killed the worms, but at the same time nearly ruined the cabbages. Weaker applications affected the worms for a short time, according to the proportion of kerosene used, but they usually revived and continued their depredations.

SQUASH BUG (*Anasa tristis*).

These were quite abundant and troublesome. White hellebore, Paris green and London purple were used. The last two mixed with twenty parts of lime, and applied with a powder bellows, were very satisfactory. The application had to be repeated several times during the season.

SQUASH VINE BORER (*Aegeria cucurbitae*).

This destructive insect was discovered soon after the middle of July, when it was found to be working serious injury to the squash vines. Several remedial agents were immediately tried. These were injected into the soil close to the stem of the affected plants by means of an injection pump constructed on the principle of a hand corn planter. The substances used were kerosene emulsions of different strength, Paris green solution, lime water and a solution of a mixture of Paris green and lime.

The kerosene emulsions had little or no effect. A solution of Paris green, one tablespoonful to ten quarts of water, proved a partial remedy as did lime water.

The best results were secured by a mixture of one part of Paris green and twenty parts of lime in a watery solution.

This mixture when thoroughly injected around an affected stem checked the work of the borer. It is believed that this will prove a very efficient remedy, but further experiments are necessary before its merits can be definitely known.

Polysolve for the Scale Insects.

Polysolve, from Brustlein, Surry & Co., which is recommended as a remedy for scale insects was tried upon an Ivy, the leaves of which were nearly covered with scales. The polysolve was found to be quite effective in loosening the scales, and destroyed the insects when exposed. It was found to be necessary to rub the leaves with a sponge or cloth when the material was applied. By these means the scales were easily loosened, and the insects destroyed. The polysolve was not tried on trees out of doors as the scale

insects which were so numerous in 1884 had almost disappeared. It is more especially adapted to be used on in-door plants, or small shrubs than upon large trees, although it would undoubtedly be useful upon any plant infested by scale insects.

GRASSHOPPERS OR LOCUSTS.

In many sections of the State these insects proved quite injurious the past season. As a rule, they were the most troublesome to the oat crop, and quite serious losses have been reported. There seems to be little doubt that they are on the increase, and the comparatively mild winter just passed is favorable to their rapid multiplication.

A hot, dry summer is also favorable, and if these conditions obtain serious losses are likely to occur. About the only practical method of fighting the common grasshopper is to aim at the destruction of the eggs. Fall or winter plowing is often a ready means of accomplishing this end. Harrowing is also quite effectual.

After the insects have made their appearance chickens and turkeys, if allowed to run at large, will destroy great numbers, and derive nearly their whole subsistence from them.

ARMY WORM (*Leucania unipuncta*.)

Correspondents from several different sections of the State reported this insect as quite abundant and injurious the past season.

Mr. Emmett Mix, President of the Board of Control of the Station, who resides in Franklin county, about six miles west of Columbus, wrote as follows:

AVENUE, July 27, 1885.

Prof. W. R. Lazenby:

DEAR SIR: Within the last three days a worm has been at work on my oats and has destroyed at least one-half of the crop. The worm is about one and one-fourth inches long, usually of a dark brown color, though some are lighter and some even darker than a dark brown.

They climb the stalk and eat the oats off. The ground is literally covered with the grain, which is a total loss. What are they, and how long do they continue their depredations? An early answer is desirable.

In response to this letter Prof. N. S. Townshend and the Director of the Station visited the farm of Mr. Mix the following day. It was then seen that the insect in question was the army worm, and that the injury being done was fully as great as reported.

Although the oats were scarcely mature enough to harvest, cutting them immediately appeared to be the most practical remedy, and this was recommended.

July 20th Mr. Mix wrote as follows:

"On examining, the following morning, the oats cut the day you were here I found that the worms had eaten large quantities from the gavel as they lay on the ground unbound. In many places fully a pint of grain to each gavel could be found. Under one gavel I counted 87 worms of all sizes, from two inches down to one-quarter of an inch in length.

"I am obliged to let the oats lay until partially cured, as they would damage if not completely spoil, if bound up without curing.

"Some shocks put up last night have worms all through them, and in taking them down a considerable quantity of oats shake out from each bundle.

"They are not so badly injured, I think, as those left on the ground unbound. I am still in doubt as to the best plan to pursue, but will await further developments and report.

"There seems to be no perceptible decrease in numbers. If any die others take their places. The extent of the injury is more marked as the oats decrease."

August 3d Mr. Mix wrote as follows:

"The work of the army worm on my oat crop seems to diminish, as the oats which remain uncut approach maturity. They appear to prefer oats that are green or in the milk. The variety known as White Russian has suffered much more than other varieties. Oats on black ground have suffered more than those on clay ground, because later in maturing. In many low places in the field there is nothing but straw left standing. The worms do not bother the shocked oats very much and I shall continue cutting as rapidly as possible.

"The grass in the fence corners of the oat field in many places is entirely gone. Blue grass appears to have suffered the most and is their favorite food.

"Hogs and chickens are devouring vast numbers of the worms. The only crop injured, so far as I have heard, is oats and only certain fields of these.

"About one-half the fields in my neighborhood are attacked.

"In some places the grasshoppers are doing almost if not quite as much injury. This is especially the case where the oat fields adjoin meadows recently cut."

The following brief history of this not uncommon pest may be of interest:

"The perfect insect is a light brownish or fawn colored moth. The female deposits her eggs in spring, usually between the folded sides of a dry blade of grass.

"The eggs hatch in about ten days and the worm, unless very abundant, has much the same habit as the well known cut worm.

"When very numerous they acquire the marching habit. Wet springs, preceded by one or more dry summers, appear to be favorable to their rapid multiplication. They are seldom abundant any two consecutive years.

"When so abundant as to invade any particular locality crops may be saved by plowing trenches in front of the marching hosts, and in these scattering freshly cut June grass or red top, sprinkling the same with a solution of Paris green. The worms are very voracious and are readily poisoned.

REPORT ON WEEDS.

There are few objects in nature better understood, in a general way, than that class of plants denominated weeds. Yet definite and correct knowledge regarding the history, habits of growth, etc., of these intruders is rarely to be found.

In former reports the Station has given a full description of many of the worst species and has treated of the following subjects:

1. Methods by which weeds are disseminated and propagated.
2. Habit of growth and duration of life.
3. The best methods of destruction.

The investigations the past year have included the following additional points:

1. Adaptability of weeds to certain soils.
2. A classified list of the weedy plants of the State.

In addition to this, descriptive notes of some of the more troublesome and least known species are given, also some further observations on the prolificacy of certain weedy plants.

WEEDS ON DIFFERENT SOILS.

A very little observation shows that different plants are partial to some particular variety of soil.

It is true that many species have a wide range and are found under a great variety of conditions, as regards soil and climate, but the fact remains that the growth of weeds is very largely affected by differences of soil alone. That is, clays, limestones, sands, peats, and a mixture of two or more of these, which goes under the common name of a loamy soil, will each produce some weeds peculiar to itself.

The weedy plants of the State are distributed, according to soil, nearly as follows:

Weeds of clays,	About 10 per cent.
Weeds of limestones,	About 20 per cent.
Weeds of sandy soils,	About 15 per cent.
Weeds of peats or vegetable moulds,	About 15 per cent.
Weeds of mixed loams,	About 40 per cent.

The different kinds of soil just mentioned not only present different species of weeds, but produce them in different proportions, as regards quantity or number of individuals.

As a rule, the weeds of clays and sandy soils are neither so plentiful nor so luxuriant as those of limestones and mixed loams, hence they are less troublesome. Our loams, which are usually the most fertile soils, naturally produce a greater abundance and a greater variety of weeds than soils of a less productive character.

Whether a soil be poor or rich, weeds by occupying space and appropriating food, lessen the yield of crops.

It should also be borne in mind that by allowing weeds to perfect their seeds, they cause still greater exhaustion of the soil, besides preparing the way for their reappearance.

The classified list of weeds appended to this report contains some suggestive notes as to the habits and localities of the different species.

GENERAL REMARKS.

Life is a constant struggle for existence. This is just as true of the vegetable as of the animal kingdom. The weak succumb and only the fittest survive, and to-day the farmer has to contend with the weeds that have been combatted with plow, with scythe and with hoe, and have survived and multiplied their kind. On the other hand, the farm crops have been given every opportunity to grow until they have been brought to the present high state of perfection. If the issue between the weeds and farm crops as to which shall occupy the land is left to be settled by them, the weeds invariably come off victors.

In order to make preparation for a battle, one must have knowledge of the character and strength of the enemy, and the more thorough our knowledge of the peculiar habits of the weeds against which we are to battle the more efficacious should be the blows we deal.

There are three points concerning weeds that are of the deepest practical interest to the farmer, viz.: How the weeds get on the farm; the character and amount of injury they are likely to cause; and how to get rid of them.

The following descriptive notes have been prepared with the hope that they may be of assistance to those who desire a better knowledge of the particular species mentioned, and with which every cultivator of the soil may sooner or later have to contend.

The seeds of scores of species of foreign plants are emptied upon our shores each year in the ballast deposits left about our principal sea-ports by vessels from foreign countries,—largely from Europe, but also from many other countries. A great many come as impurities in seeds purchased in foreign countries, and in straw, chaff, hay, etc., used for packing many kinds of goods shipped here. Still, others are imported with the expectation that they will supply a real or supposed need, and afterwards abandoned or allowed to escape and become troublesome weeds.

DESCRIPTIVE NOTES OF TROUBLESOME SPECIES.

WILD PARSNIP (*Pastinaca sativa*, L.)

Root biennial, spindle-shaped, hard or fleshy, acrid, poisonous. Plant light or yellowish-green, two to six feet high; stem furrowed or grooved, somewhat branching, mostly along the upper part. Leaves downy beneath, somewhat shining above, pinnate with three or four pairs of sessile leaflets two to four inches long, incisedly toothed, rather blunt pointed, and a terminal petiolulate odd leaflet, three-lobed. The small yellow flowers are borne in large umbels or flat-topped clusters, terminating the stem and branches, the latter usually rising as high as, or above the end of the stem. There is no involucre nor involucl. The five teeth of the calyx are very small or wanting. The yellow petals are broadly lance-shaped, the long slender point rolled inward. The fruit is thin, flatly compressed, and consists of two oval disk-like seeds, with broad wing like margins. Between the thread-like ribs on the side of the seed are yellowish-green channels marked with slender purplish lines—the oil-tubes. Blooms in June, July and August, and first fruit ripens in August. Native of Europe.

This is merely a degenerate form of the garden parsnip, escaped from the gardens and "run wild."

The root has become dwindled in size, hard, branching and poisonous. It is very prolific; 19,000 seeds were counted upon a single large plant, and two

smaller plants bore 4,834 and 8,080 seeds respectively. These are carried by streams and rivers so that in the rich alluvial bottoms the plant has become a great pest; sometimes when left to itself it takes complete possession of portions of the land. It can not be exterminated without the closest attention being given to keeping it mowed or plowed under so that it cannot develop leaves or ripen seeds. Its rapid multiplication along railroads and public highways is frequently the cause of unmeasured trouble on the adjoining farms, to which it sooner or later finds its way.

The State law for the destruction of weeds along the public roads and railroads should no longer be a dead letter, as it now is in so many districts, then there would be less cause for complaint from this and many other useless weeds.

THORNY OR SPINY AMARANTH. ARMY WEED (*Amarantus spinosus*, L.)

An annual, growing one to three feet high, bushy-branched; stem smooth, often reddish or purple. Leaves dull green, one to two inches long, obtuse at the apex, tapering at the base into a petiole about as long as the leaves; margins entire. At the axil of each leaf is a pair of sharp, straight, slender spines, one-fourth to one-half an inch long. Flowers numerous, small, greenish-yellow, the fertile ones in globular clusters in the axils of the leaves, and the sterile in terminal and sub-terminal spikes. Fruit a small, hard and polished seed of a brown color and enclosed within a thin membranous covering. Blooms in August; fruit ripens in October. Native of India.

This vile foreigner was introduced into many parts of Southern Ohio from the South during the civil war, whence the name, "Army Weed," by which it is commonly known in those localities. It first made its appearance in the towns, and the seeds were carried into the surrounding country in the mud, clinging to the wheels of vehicles and in manure hauled out and spread upon the fields. The seed possesses great vitality, and will pass through animals uninjured. Stock will not feed upon it and the spines makes it so disagreeable that they will seldom graze among it.

The plants are not difficult to kill, and mowing about the time of coming into bloom destroys them. It would not be difficult to eradicate were it not that the seeds remain in the ground for a long time without germinating, or until the conditions are favorable. A little care for a few years in removing all plants before any of the seeds ripen, will gradually rid a place of them.

WILD MUSTARD. BLACK MUSTARD. YELLOW BLOW (*Sinapis nigra*, L.)

Annual, two to six feet high; stem round, smooth, much branched. Leaves scabrous, petiolate; the lower ones variously lyrate with a large terminal lobe, and dentate; the upper ones narrow, entire, drooping. Flowers in slender racemes, cruciform, about half an inch across, the sepals and petals sulphur-yellow. Pods one-half to one inch long, smooth, somewhat four-angled, closely appressed to the stem, about five-seeded. Seeds small, globous, various shades of brown to nearly black. Flowers in June and July. Seeds ripen in August. Introduced from Europe.

From the seeds of this, and another species (*S. alba*, L.), not generally escaped from cultivation, is prepared the well known condiment, mustard; and the leaves of the young plants are eaten as greens. It has escaped from cultivation and become a great nuisance in the streets of villages, along roadsides, in cultivated fields, in spring barley and oats, and in other places. Like most annuals, if cut to the ground about the time of blooming it is killed, and a very few seasons of clean culture eradicates it. The rapidity with which it is spreading, however, indicates a shameful lack of interest and vigilance on the part of farmers into whose neighborhoods it is now making such inroads. It

is not so prolific as many of the weedy plants, average plants producing 2,000 to 3,000 seeds. On large specimen found this year on the University farm over 31,000 seeds were found.

HORSE-WEED. BUTTER-WEED. MARE'S TAIL. COLT'S-TAIL. MULE'S-TAIL

(*Erigeron canadense*, L.)

Annual, six inches to eight feet high—commonly two to four feet high on ordinary soils. Stem erect, furrowed, branching, wand-like; whole plant bristly-hairy. Leaves one to four inches long, sessile, lance-linear, rough margined, mostly entire, the lower ones sparingly toothed, and those from the root cut-lobed. Heads of flower numerous, small, cylindrical, racemose upon the branches and constituting an oblong panicle. Rays numerous, white, inconspicuous; pappus simple, long; seeds (akenes) small. Blooms in August and September, and the first seeds ripen in September. Native of the United States.

Although believed to be a native of the United States, this weed has not yet found its way into all parts of Ohio. The high waters of 1882 and 1883 left it on farms in the southern part of the State where it was before unknown. It is very troublesome in lawns and pastures, and sometimes in meadows and cultivated fields, and is a very unsightly plant in waste places. Its hairiness gives it a dirty, hoary appearance. Not only is it common in the United States, but also in Europe, and it is said, in other regions. On a very sterile soil it will grow a few inches high and ripen seeds, and on rich land grows very large. Mowing just before or at the time of blooming will kill it, and if none are permitted to mature seeds, it requires but two or three years to rid a place of it.

MAY WEED. DOG FENNEL (*Marula cotula*, DC.)

Annual, six to twelve inches high, erect, smooth or somewhat pilose, leafy, much branched, diffuse. Leaves alternate, one to three inches long, twice to thrice divided into numerous short, narrow, flat, pointed segments. Flowers numerous, in heads about one inch in diameter, on long pubescent peduncles, terminating the branches. Involucre hemispherical; scales many, the margins whitish. Ray flowers neutral; rays white, about fourteen, spreading at first, but soon reflexed. Disk flowers yellow, perfect. Receptacle conical or sub-cylindrical, chaffy, at least at the summit, with bristly pales shorter than the flowers. Seeds (akenes) inversely conical or oblong, smooth or slightly tuberculate in lines, ribbed. Pappus none, or a minute disk. Blooms from June until frost. Fruit ripen from August until frost. Introduced from Europe.

This is an acrid, strongly fetid weed, common in waste places, preferring dry, rather compact soils. It is not very troublesome in cultivated fields, but forms large patches in farm-yards, pastures, along lanes and roadways. Farm animals will not feed upon it, but it is sometimes accidentally eaten by cows grazing among it, and imparts a bitter taste to the milk. It is said to be annoying to flies and some other insects. It branches so near the surface of the ground that it is difficult to mow close enough to kill it. If cut off at the surface of the ground it is destroyed. Cultivation soon eradicates it. It grows in situations difficult to reach by cultivation, and is thus allowed to multiply in localities where once established.

PROLIFICACY OF WEEDS.

The examination into the fecundity of weedy plants was continued with the results recorded below. In most cases plants were taken that had fairly favorable conditions for development, so that the number of seeds given may be

regarded as rather above the average as they ordinarily grow. Where plants of extraordinary growth were taken, it is so stated in the notes upon it. Not until we learn something of the enormous numbers of seeds produced by some of our weedy plants, can we comprehend the full significance of the adage, "One year's seeding makes seven year's weeding."

The seeds upon two plants of Wild Parsnip (*Pastinaca sativa*, L.) were counted, and found to be 8,080 and 4,834 respectively. A large plant bore 19,000 seeds.

A plant of Pepper Grass or Tongue Grass (*Lepidium Virginicum*, L.), a little above the average size, bore 13,500 silicles or seed pods, each of which contained two seeds, making a total of 27,000 seeds as the product of the plant.

A rather large plant of Sour Dock, Curly Dock, Narrow Dock or "Greens" (*Rumex crispus*, L.) bore 36,900 seeds.

Upon one plant of Shepherd's Purse (*Capsella Bursa-pastoris*, Moench) were found 3,100 silicles, containing an average of 25 seeds each,—ascertained by taking 20 silicles from the plant at random, and counting the seeds in each,—making 77,500 the total number of seeds produced. Another plant bore 2,500 silicles, or 62,500 seeds, the average number of seeds per silicle being the same in both plants.

A plant of Bearded Plantain (*Plantago aristata*, Mx.), a species recently introduced from the West in grass seed, and now spreading rapidly in meadows, bore 4,240 seeds.

A very large specimen of Burdock (*Lappa major*, Gærtn.), found at the intersection of two streets in Columbus was $7\frac{1}{2}$ feet high, and the branches spread 9 feet. It bore 720 large heads of flowers, likely to produce the average number of seeds; and 364 smaller heads, not mature enough to determine the quantity of seeds that they might produce. The average number of seeds (akenes) produced by each head, determined the previous season, was 556, making a total of 400,328 seeds the second year of its existence, the plant being a biennial.

The Bristly Fox-tail Grass (*Setaria glauca*, Beauv.), also known by the names of Barn Grass, Summer Grass, Pigeon Grass, etc., is very prolific. Eighty-two spikes of seeds were found upon one plant. The number of seeds upon 10 spikes were counted. The largest number found was 387, and the smallest number 87, there being many immature seeds on the latter, not included in the number given. The average number of seeds per spike was 237.8, giving a total of 19,499 seeds for the whole plant.

A large specimen of Green Fox tail Grass or Bottle Grass (*Setaria viridis*, Beauv.) had on it 149 spikes. The largest number of seeds found on one spike was 555, the smallest number 90, and the average 309. The total number was thus estimated to be 46,041 seeds.

Upon a large plant of Hedge Mustard (*Sisymbrium officinale*, Scop.) 1,668 siliques or seeds pods were found, containing an average of 14.2 seeds each, or 23,685 seeds on the plant. The largest number of seeds found in one silique was 20; the smallest number was 8.

A large plant of Wild Mustard (*Sinapis nigra*, L.) was found to bear 6,864 siliques. The largest number of seeds per silique was 8, and the smallest number 1; the average was 4.6, the total number thus shown to be 31,574 seeds.

A large Common Plantain (*Plantago major*, L.) bore 33 spikes each having from 139 to 448 pyxes, and each pyxis containing from two to six seeds. The average number of seeds per pyxis was 4.5 and the average number of pyxes per spike 293.4, the total number of seeds per plant being 43,569.

A specimen of Motherwort (*Leonurus cardiaca*, L.) consisted of 11 stalks

with 360 to 3,432 seeds on each stalk, or an average of 1,701 per stalk. The total number of seeds was 18,711.

LIST OF THE PLANTS OF OHIO WHICH GENERALLY APPEAR AS WEEDS.

The following list of the weedy plants of the State is divided into three classes:

1. *Weeds that are universally injurious.*
2. *Weeds that are usually troublesome.*
3. *Weeds that are occasionally troublesome.*

Each class is divided into two groups, viz.- (1) *Native species.* (2) *Introduced species.*

It will be observed that nearly 85 per cent. of the first class, which includes the worst weeds of the State, are introduced species.

The most general of the common names by which the weeds are known are given in the first column. The botanical or scientific name of each species is given in the middle column. In the last column are recorded the soils and situations in which the weeds chiefly occur.

CLASS I.

Common name.	Scientific name.	Where found.
<i>Native Species.</i>		
Tongue- or Pepper-grass	<i>Lepidium Virginicum</i> , L.	Pastures, roadsides.
Evening Primrose	<i>Oenothera biennis</i> , L.	Cultivated fields, banks of streams.
Iron-weed	<i>Veronica Novboracensis</i> , Willd.	Clay soils; pastures.
Cut's-tail	<i>Erigeron Canadense</i> , L.	Lawns, pastures, roadsides.
White-weed	<i>Erigeron annuum</i> , Pers.	Meadows and pastures.
Horse-weed. Great Rag-weed	<i>Ambrosia trifida</i> , L.	Alluvial soils; pastures. [sides.
Rag-weed. Bitter-weed	<i>Ambrosia artemisiifolia</i> , L.	Cultivated soils; wheat stubble, road-
Horse-nettle. Sand Brier	<i>Solanum Carolinense</i> , L.	Sandy soil, pastures.
Common Milk-weed	<i>Asclepias Cornuti</i> , Decaisne.	Rich soil, fields, roadsides.
Bur or Hedgehog grass	<i>Cinchrus tribuloides</i> , L.	Sandy soil, cultivated grounds.
<i>Introduced Species.</i>		
Wild Mustard. Yellow Blow	<i>Sinapis nigra</i> , L.	Roadsides, waste places.
Shepherd's Purse	<i>Capsella Bursa-pastoris</i> , Moench.	Pastures, gardens. [wheat.
Cockle	<i>Lychnis githago</i> , Lam.	Grain fields, especially troublesome in
Chickweed	<i>Stellaria media</i> , Smith.	Damp, cold soils.
Corn Spurry. Tares	<i>Spergula arvensis</i> , L.	Common on sandy and light soils.
Purslane	<i>Portulacca oleracea</i> , L.	Rich soil; gardens. [fields.
Low Mallows. Cheeses	<i>Malva rotundifolia</i> , L.	Gardens, lawns, roadsides and edges of
Spiny Sida	<i>Sida spinosa</i> , L.	Waste places, gardens.
Velvet-leaf. Butter-print	<i>Abutilon avicennae</i> , Gaertn.	Rich soil, cultivated grounds.
Stone Clover. Rabbit-foot	<i>Trifolium arvense</i> , L.	Thin or sandy soils.
Low Hop Clover	<i>Trifolium procumbens</i> , L.	Lawns, waste places.
Tree Clover. Bokhara Clover	<i>Melilotus alba</i> , Lam.	Cultivated grounds, roadsides.
Common Vetch. Tare	<i>Vicia sativa</i> , L.	Cultivated grounds.
Wild Carrot. Bird's Nest	<i>Daucus carota</i> , L.	Meadows, fields, and roadsides.
Wild Parsnip	<i>Pastinaca sativa</i> , L.	Low ground, pastures.
Teasel	<i>Dipsacus sylvestris</i> , Mill.	Borders of fields, roadsides.
Clot-bur	<i>Xanthium strumarium</i> , L.	Low ground, pastures.

CLASS I.—Continued.

Common name.	Scientific name.	Where found.
<i>Introduced Species.</i>		
Thorny Clot-bur.....	Xanthium spinosum, L.....	Roadsides, waste places.
May-weed. Dog Fennel.....	Maruta Coula, DC.....	Hard soil, roadsides.
Yarrow. Milfoil.....	Achillea millefolium, L.....	Pastures, meadows.
Ox-eye Daisy.....	Chrysanthemum Leucanthemum, L.....	Meadows, pastures.
Common Thistle. Bull Thistle.....	Cirsium lanceolatum, Scop.....	Pastures, waste places.
Canada Thistle.....	Cirsium arvense, Scop.....	Pastures, meadows, fields.
Burdock.....	Lappa major, Gertn.....	Rich soil, fence-rows.
Dandelion.....	Taraxacum Dens-leonis, Desf.....	Pastures, fields, lawns.
Sow-thistle.....	Sonchus asper, L.....	Strawberry beds, gardens.
Common Plantain.....	Plantago major, L.....	Door-yards and lawns, pastures, fields.
Rib-grass. Narrow Plantain.....	Plantago lanceolata, L.....	Dry pastures and meadows.
Common Mullein.....	Verbascum thapsus, L.....	Neglected pastures and meadows.
Moth Mullein.....	Verl ascum blattaria, L.....	Pastures, highways.
Toad-flax. Butter-and-eggs.....	Linaria vulgaris, Mill.....	Dry places, upland meadows.
Motherwort.....	Leonurus cardiaca, L.....	Waste places, gardens.
Viper's Bugloss. Blue Devils.....	Echium vulgare, L.....	Road-sides, pastures. [in wheat fields.
Wheat Thief. Pigeon-weed.....	Lithospermum arvense, L.....	Grain fields, pastures; very troublesome
Hound's Tongue.....	Cynoglossum officinale, L.....	Shaded pastures, fence rows.
Bind-weed.....	Convolvulus arvensis, L.....	Dry fields, pastures.
Wild Sweet Potato.....	Ipomeea panduratus, Meyer.....	Sandy fields.
Ratland Beauty.....	Galystegia sepium, Br.....	Low grounds, cultivated fields.
Jimson-weed. Thorn-apple.....	Datura stramonium, L.....	Rich soil, farm yards.
Lamb's Quarters. Pig-weed.....	Chenopodium album, L.....	Cultivated fields, waste places.
Reflexed Amaranth.....	Amarantus retrofractus, L.....	Corn fields.
Spiny Amaranth.....	Amarantus spinosus, L.....	Cultivated fields, roadsides.
Knot-grass. Goose-grass.....	Polygonum aviculare, L.....	About dwellings, roadways.
Curly Dock. Sour Dock.....	Rumex crispus, L.....	Low grounds, pastures.
Field Sorrel.....	Rumex acetosella, L.....	Sandy, poor soil, pastures.
Stinging Nettle.....	Urtica dioica, L.....	Pastures, waste places.
Slender Rush.....	Juncus tenuis, Willd.....	Beaten pastures, dry places.
Cheat. Ch-s.....	Bromus secalinus, L.....	Grain fields, meadows.
Couch-, Twitch-, or Quitch-grass.....	Triticum repens, L.....	Cultivated fields; a very great pest.

Stinking Eragrostis	Eragrostis pectoides, var. megastachya..	Gardens, lanes.
Summer, Fox-tail- or Pigeon-grass.....	Setaria glauca, Beauv	After wheat, lawns, gardens.
Green Fox-tail- or Bottle-grass.....	Setaria viridis, Beauv.....	Lawns, fields, gardens.

CLASS II.		
Common name.	Scientific name.	Where found.
<i>Native Species.</i>		
Abortive Crowfoot.....	Ranunculus abortivus, L.....	Damp situations.
Poison Ivy. Poison Oak.....	Rhus Toxicodendron, L.....	Old fence-rows, wood-lots.
Green-flowered Bush-tri foil	Desmodium viridiflorum, Beck	Alluvial soils.
Norwegian Potentilla	Potentilla Norvegica, L.....	Pastures, roadsides.
Cinquefoil. Five-finger.....	Potentilla Canadensis, L.....	Meadows, neglected fields, poor soils.
Boneset. Thorowgwort.....	Eupatorium perfoliatum, L.....	Wet grounds, pastures.
Starved Aster	Aster miser, L.....	Roadsides, pastures.
Heath-like Aster.....	Aster ericoides, L.....	Pastures, thin soils.
Rough Rutbeck'a. Yellow Daisy	Rudbeckia hirta, L.....	Meadows, pastures.
Actinomenis	Actinomenis squarrosa, Nutt.....	Fence-rows, fields.
Bar-marigold	Bidens frondosa, L.....	After Indian corn, wet pastures.
Beggar-ticks. Chrysanthemum—flowered Marigold.....	Bidens chrysanthemoides, L.....	After Indian corn, wet pastures.
Spanish Needles	Bidens bipinnata, L.....	After Indian corn, along streams.
Golden Rod	Solidago Canadensis, L.....	Fields, fence-rows.
Everlasting	Gnaphalium polycephalum, Mx	O'd pastures.
Wild Lettuce	Lactuca Canadensis, L.....	Dry soils, door-yards, fence-rows.
Bearded Plantain	Plantago aristata, Mx.....	Meadows.
Germanuer.....	Ternstroem Canadense, L.....	Low grounds, fence rows.
Beggar's Lice.....	Cynoglossum Morisoni, D C	Pastures, woodlands.
Ground Cherry.....	Physalis viscosa, L.....	Sandy grass lands.
Poke-weed. Pige n-berry	Phytolacca decandra, L.....	Rich soil; barn-lots; clearings, lgrounds.
Milk Purslane. Spotted Spurge.....	Euphorbia maculata, L.....	Gravelly soils, road sides, cultivated
Large Spotted Spurge.....	Euphorbia hypericifolia, L.....	Dry, sandy fields, pastures.
Wild Hyacinth. Quamash	Scilla Fraseri, Gray	Damp pastures, river bank.
Bristle-spined Galingale.....	Cyperus strigosus, L.....	Wet, sandy meadows and cultivated
Old-wich Grass	Panicum capillare, L.....	Sandy soils, pastures.

CLASS II.—Continued.

Common name.	Scientific name.	Where found.
<i>Introduced Species.</i>		
Buttercups. Tall crawfoot.....	Ranunculus acris, L.....	Meadows, pastures.
Bulbous Buttercups.....	Ranunculus bulbosus, L.....	Pastures.
Charlock.....	Sinapis arvensis, L.....	Gardens, pastures.
St. John's-wort.....	Hypericum perforatum, L.....	Dry pastures.
Bouncing Bet. Soapwort.....	Saponaria officinalis, L.....	Waste places, along brooks.
Mouse-ear Chickweed.....	Cerastium vulgatum, L.....	Pastures, borders of fields.
Flower-of-an-hour. Bladder Ketmia.....	Hibiscus trionum, L.....	Gardens, cultivated grounds.
Black Medick. Nonesuch.....	Medicago lupulina, L.....	Cultivated fields, roadsides.
Cleavers. Goose-grass.....	Galium aparine, L.....	Moist pastures, thickets.
Elecampane.....	Lula helenium, L.....	Roadsides, waste places.
Tansy.....	Tanacetum vulgare, L.....	Gardens, waysides.
Chicory.....	Cichorium intybus, L.....	Meadows, cultivated fields.
Speedwell.....	Veronica arvensis, L.....	Grain fields, gardens.
Spear-mint.....	Mentha viridis, L.....	Wet ground, waste places.
Catnip.....	Nepeta cataria, L.....	Rich soils, fence rows, fields.
Ground Ivy. Gill-over-the-ground.....	Nepeta glechoma, Benth.....	Moist, shaded places, fence rows.
Heal-all. Self-heal. Blue Curls.....	Brunnella vulgaris, L.....	Pastures, fields.
Hoarhound.....	Marubium vulgare, L.....	Dry, stony pastures.
Hen-bit. Dead Nettle.....	Lamium amplexicaule, L.....	Gardens, fields, pastures.
Common Vervain.....	Verbena officinalis, L.....	Pastures, waysides.
Narrow-leaved Stickseed.....	Echinospermum lappula, Lehm.....	Waste places.
Flax Dodder.....	Cuscuta epilinum, Weihe.....	Flax fields, cultivated fields.
Nightshade.....	Solanum nigrum, L.....	About dwellings, pastures, fields.
White Amaranthus.....	Amaranthus albus, L.....	Barn-yards, roadsides near towns.
Black Bindweed.....	Polygonum convolvulus, L.....	Cultivated grounds.
Lady's Thumb. Spotted Knotweed.....	Polygonum persicaria, L.....	About dwellings, roadsides.
Bitter Dock. Broad-leaved Dock.....	Rumex obtusifolius, L.....	Pastures, meadows.
Crab grass. Yard-grass.....	Elyusine ludica, Gertn.....	Door-yards, lanes, pastures.
Common Crab grass. Finger-grass.....	Panicum sanguinale, L.....	Gardens, cultivated fields.
Cock's-foot. Barnyard-grass.....	Panicum crus-galli, L.....	Wet meadows, barn-yards.

CLASS III.

Common name.	Scientific name.	Where found.
	<i>Native Species.</i>	
Early Meadow Rue	<i>Thalictrum dioicum</i> , L	Rocky wooded pastures.
Tail Meadow Rue	<i>Thalictrum cornuti</i> , L	Wet meadows.
Early Crowfoot	<i>Ranunculus fascicularis</i> , Muhl.	Rocky pastures.
Creeping Crowfoot	<i>Ranunculus repens</i> , L	Moist or shaded meadows and pastures.
Pawpaw	<i>Asimina triloba</i> , Adam	Moist pastures, hillsides.
May-apple, Mandrake	<i>Podophyllum peltatum</i> , L	Woodland, pastures.
Common Blue Violet	<i>Viola cucullata</i> , Ait	Gardens; fence rows.
Long-leaved Stitchwort	<i>Stellaria longifolia</i> , Muhl.	Grass-lands.
Spring Beauty	<i>Claytonia virginica</i> , L	Moist open woodland pasture.
Spotted Touch-me-not	<i>Impatiens fulva</i> , Nutt.	Shady, wet places.
Pale Touch-me-not	<i>Impatiens pallida</i> , Nutt.	Shady, wet places.
Yellow Wood-sorrel	<i>Oxalis stricta</i>	Pastures, cultivated grounds.
White Clover	<i>Trifolium repens</i> , L	Fruit gardens, cultivated fields.
Creeping Bush-clover	<i>Lespedeza repens</i> , Torr. & Gray.	Dry sandy soils.
Wild Senna	<i>Cassia maritima</i> , L	Alluvial soils, pastures.
White Avens	<i>Geum album</i> , Gmelin	Borders of woods.
Common Blackberry	<i>Rubus villosus</i> , Ait	Borders of thickets, ravines, fence rows.
Dewberry, Low Blackberry	<i>Rubus canadensis</i> , L	Rocky hills, pastures.
Willow-herb	<i>Epilobium coloratum</i> , Muhl.	Low pastures.
One-seeded Star-cucumber	<i>Sicyos angulatus</i> , L	Wet places.
Sanicle, Black Snake-root	<i>Sanicula marilandica</i> , L	Copse.
Cow Parsnip	<i>Heracleum lanatum</i> , Michx	Moist, rich ground.
Spotted Cowbane, Water Hemlock	<i>Cicuta maculata</i> , L	Swamps and wet grounds.
Honewort	<i>Cryptota canadensis</i> , D. C	Woodland pastures.
Common Elder	<i>Sambucus canadensis</i> , L	Rich soils, pastures, fence rows.
Button-bush	<i>Cephalanthus occidentalis</i> , L	Wet pastures.
Bluets	<i>Houstonia arifolia</i> , L	Wet grass lands.
Joe Pye Weed, Trumpet Weed	<i>Eupatorium purpureum</i> , L	Low grounds, pastures.
White Snake-root	<i>Eupatorium ageratoides</i> , L	Rich, woodland pastures.
Aromatic Thoroughwort	<i>Eupatorium aromaticum</i> , L	Copse.
Corymbose Aster	<i>Aster corymbosum</i> , Ait	Woodlands.

CLASS III.—Continued.

Common name.	Scientific number.	Where found.
	<i>Native Species.</i>	
New England Aster.....	Aster Novæ Angliæ, L.....	Moist grounds.
Common Fleabane.....	Eriogon Philadelphicum, L.....	Fence situations.
Large Golden-rod.....	Solidago gigantea, Ait.....	Fence rows.
Cup-plant. Leaf-cup.....	Silphium perfoliatum, L.....	Rich soils, banks of streams.
Ox-eye.....	Helianthus levis, Pers.....	Banks of streams.
Cone flower.....	Rudbeckia laciniata, L.....	Low, shaded situations.
Large Wild Sun-flower.....	Helianthus giganteus, L.....	Low grounds.
Wild Sunflower.....	Helianthus strumosus, L.....	River banks.
Sneez-weed.....	Helianthus autumnale, L.....	Alluvial soils.
Everlasting.....	Gnaphalium decurrens, Ives.....	Dry fields, hill-sides.
Plantain-leaved Everlasting.....	Antennaria plantaginifolia, Hook.....	Sterile knolls.
Fireweed.....	Erechtibites hieracifolia, Raf.....	Newly cleared land.
Golden Ragwort. Squaw-weed.....	Senecio aureus, L.....	Low grounds.
Rough Hawkweed.....	Hieracium scabrum, Michx.....	Dry open woods.
Rattlesnake-root. White Lettuce.....	Nabalus albus, Hook.....	Rich soil, borders of woods.
Figwort.....	Scrophularia nodosa, L.....	Damp ground, banks, fence-rows.
Blue Vervain.....	Verbena hastata, L.....	Low ground, pastures, wastes.
Fog-fruit.....	Lippia lauceolata, Michx.....	River banks.
American Germander.....	Tuercium Canadense, L.....	Damp grounds.
Wild Burgamot.....	Monarda fistulosa, L.....	Woods, fence-rows.
Hedge-Nettle.....	Stachys palustris, L.....	Wet places.
Waterleaf.....	Hydrophyllum Virginicum, L.....	Damp woods.
Waterleaf.....	Hydrophyllum app. indicatum.....	Open woods.
Miami Mist.....	Phacelia Pur-hii, Buckley.....	Moist clover fiel's, banks.
Gronovius' Dodder.....	Cuscuta Gronovii, Willd.....	Damp places, coarse herbs, low shrubs.
Glomerate Dodder.....	Cuscuta glomerata, Choisy.....	Moist prairies, Composite.
Ground Cherry.....	Physalis Philadelphica, Lamx.....	Rich ground, pastures, lawns.
Spreading Dogbane.....	Abocynum audroense nitellum, L.....	Borders of woods.
Swamp Mi kweed.....	Asclepias incarnata, L.....	Wet grounds, creek bottoms.
Pennsylvania Knotweed.....	Polygonum Pennsylvanicum, L.....	Moist, open wet places.
Flesh-colored Knotweed.....	Polygonum incarnatum, Ell.....	Borders of stream.
Smartweed. Water-Pepper.....	Polygonum hydropiper, L.....	Moist ground.

Swamps, borders of streams.
Moist grounds.
Rich woods, damp pastures.
Boys, wet pastures.
Damp meadow.
Marshy grounds, meadows, pastures.
Low grounds.
Open grounds.
Damp woods.
Low grounds.
Dry hills, woods.
Pastures, meadows, dry grounds.
River banks, fence rows.
Woodlands.
Sterile soils.
Dry grounds, low grounds.
Dry sterile soils.
Moist, sandy and gravelly soils.
Wet banks, pastures.

Grain fields, waste places.
Near dwellings.
Brooks, ditches.
Flax-fields.
Old fields.
Sandy soil, waste places.
Waste places.
Fence-rows.
Dry places.
Sandy soil, waste grounds.
Sandy fields.
Low, wet grounds.
Waste places.
Moist grounds.
Cultivated fields.
Waste grounds.
Waste places.
Waste places.

Saururus cernuus, L.
Behmeria cylindrica, Willd.
Arisema triphyllum, Torr.
Symplocarpus foetidus, Salisb.
Alium Canadense, Kalm.
Juncus effusus, L.
Cyperus phymatoides, Michx.
Carex straminea, Schk.
Muhlenbergia sylvatica, Trin. & Gray.
Muhlenbergia Mexicana, Trin.
Muhlenbergia diffusa, Schreber.
Poa compressa, L.
Elymus Virginicus, L.
Gynnostachyum hystrix, Schreb.
Danthonia spicata, Beauv.
Panicum dichotomum, L.
Andropogon furcatus, Muhl.
Equisetum arvense, L.
Equisetum hyemale, L.

Introduced Species.

Delphinium consolida, L.
Papaver somniferum, L.
Nasturtium officinale, R. Br.
Camelina sativa, Crantz.
Raphanus Rhyphanistrum, L.
Arenaria scrophylifolia, L.
Melilotus officinalis, Willd.
Helenium tuberosus, L.
Filago Germanica, L.
Anagallis arvensis, L.
Veronica agrestis, L.
Menha piperita, L.
Galeopsis tetrahit, L.
Symphitum officinale, L.
Ipomoea purpurea, Lam.
Nicandra physalodes, Gaertn.
Chenopodium botrys, L.
Chenopodium ambrosioides, L.

Lizard's-tail
False Nettle
Indian Turnip
Skunk Cabbage
Wild Garlic
Common or Soft Rush
Galingale
Sedge
Wood Drop-seed Grass
Mexican Drop-seed Grass
Drop-seed. Nimble Will
Pennsylvania Blue Grass
Lyme-Grass. Wild Rye
Bottle-Brush Grass
Wild Oat Grass. Poverty Grass
Panic Grass
Beard Grass
Common Horse-tail
Scouring Rush. Shave-Grass

Larkspur
Common poppy
True Water-Cress
False Flax
Wild Radish. Jointed Charlock
Thyme-leaved Sandwort
Yellow Melilot
Jerusalem Artichoke
Herb Impia
Common Fimbernel
Field Speedwell
Peppermint
Common Hemp-Nettle
Common Comfrey
Common Morning-Glory
Apple-of-Peru
Jerusalem Oak. Feathered Geranium
Mexican Tea

CLASS III. -- Continued.

Common name.	Scientific name.	Where found.
	<i>Introduced Species.</i>	
Amarantus.....	Amarantus hypochondriacus, L.....	About dwellings.
Prince's Feather.....	Polygonum Orientale, L.....	Gardens.
Bloody-veined Dock.....	Rumex sanguineus, L.....	Waste and cultivated grounds.
Cypress Spurge.....	Euphorbia cyparissias, L.....	Roadsides.
Hemp.....	Cannabis sativa, L.....	Waste and cultivated fields.
Asparagus.....	Asparagus officinalis, L.....	Fence-rows.
Field Garlic.....	Allium vineale, L.....	Wheat fields, moist meadows.
Pillous Eragrostis.....	Eragrostis pilosa, Beauv.....	Sandy or gravelly waste places.
Upright Chess.....	Bromus racemosus, L.....	Wheat fields, meadows.
Canary Grass.....	Phalaris Canariensis, L.....	Door-yards, road-sides.
Smooth Panic-Grass.....	Panicum glabrum, Gaudin.....	Cultivated and waste places.

REPORT ON ORNAMENTAL GARDENING.

The following condensed notes are the result of observations and tests made at the Station during the past two or three years. They are published in response to frequent letters of inquiry concerning the cultivation of flowers and the management of ornamental grounds.

WINDOW GARDENING

is the cultivation of plants for in-door use and home decoration. The essential requisite for success is to allow our plants all the needful *light, air* and *warmth* and protect them from the dry heat, injurious gases, etc., on one hand, and from undue cold on the other.

A *bow* or *bay window* with a southern or south-eastern exposure is most suitable for house plants.

GENERAL HINTS AS TO THE CORRECT MANAGEMENT OF HOUSE PLANTS.

- I. If possible, get good, strong, healthy plants to start with.
- II. Do not over-crowd your plants. Better keep a few well, than to have a larger number poorly cared for.
- III. Give house plants as much light as possible during the day, and darkness with a lower temperature at night.

Plants require rest. A uniform temperature of 60° to 70° in the daytime and 40° to 45° at night will give the best results.

Turning plants towards the light, if done at all, should be done regularly.

- IV. Besides light, house plants require a good supply of fresh air. Ventilation is absolutely necessary.

- V. A proper amount of moisture is necessary for both roots and top.

A dry soil or a dry atmosphere is fatal. The object of watering is at least two-fold: (1) It supplies plant food, or elements of fertility contained in itself. (2) It converts the plant food, or nourishment of the soil, into a liquid form so that it may be absorbed by the roots.

The roots of plants should be kept *moist*, not wet.

Where the drainage is the most perfect plants will generally be the healthiest and will need watering the oftenest.

PRACTICAL HINTS FOR WATERING PLANTS.

Rain water is better than spring or well water. Hard water may be greatly improved by adding a drop or two of hartshorn or a little soda,—a small nugget about the size of a pea, to every gallon of water used.

Time.—*Morning is best*, next the evening. Never water house plants when the sun is shining brightly upon them.

The supply of water must be regulated according to the demands of the plant.

The condition of the plant and of the surface soil is the best guide.

Never give water when the soil is moist to the touch.

Nearly all plants require more water when in bloom than at any other time; they require more in a *warm* temperature than in a cold; more when in a state of active growth than when at rest.

Plants in open rooms usually require water once a day, and some that delight in moisture, need it twice.

All plants should be examined at least once a day, with intent to water, if that is necessary. Experience alone can determine the proper amount to give each plant.

Cleanliness —The leaves of plants should be kept free from dust, hence frequent washings are absolutely essential.

Never wet the flowers of a plant nor allow drops of water to stand on the leaves in the sunshine.

Never allow water to stand in the saucers of the pots, unless the plants are semi-aquatic.

INSECT ENEMIES—HOW TO DESTROY THEM.

The Red Spider. It is only found where the air is dry, hot and close. Remedies—1. Correct the conditions that favor its development. 2. Syringe with a solution of whale oil soap; one-fourth pound soap to two gallons water. 3. Dust with finely ground red (Cayenne) pepper. 4. Boil one ounce of Quassia wood in three pints of water, until but a quart remains. When lukewarm apply to every leaf with a sponge or brush. Let the plant stand fifteen minutes then wash with pure water.

The Aphis or "*Green Fly*." Small green plant lice which multiply rapidly and injure plants by sucking their juices. Remedies—Sprinkling with tobacco water, or a solution of whale oil soap. Smoking with tobacco stems.

The Scale Insect. Remedy—Frequent washing with soap suds. Use a stiff brush.

Thrips. Remedy—Tobacco smoke.

HANGING BASKETS

form one of the simplest and cheapest styles of window gardening. They are usually round, and are made of wire, earthen-ware or rustic work, i. e., the rough and gnarled roots and branches of shrubs and trees.

The soil need in no way differ from that for plants growing in pots. It *may be less rich*, and for some plants *should be*, or they will outgrow their space.

Only certain kinds of plants are suitable for hanging baskets. They should be of low, compact growth, to cover the surface, or of a drooping or trailing habit to hang over the sides. The following are among the best:

I. *Low upright plants for center*—Coleus, Achyranthes, Geranium, Centaurea, Sedum, Primula, Cerastium, Pyrethrum.

II. *Drooping or trailing plants for edge*—Vinca (Common Periwinkle), Lobelia, Lysimachia (Moneywort), Tradescantia (Wandering Jew), Linaria (Coliseum Ivy), Maurandia, Saxifragas, Ice Plant, Solanum.

CLIMBING VINES.

The English Ivy (Hedera helix) is one of the most popular ornamental plants of the window garden. The ease of culture, its beautiful foliage, and ever-green character all combine to make it a favorite.

It requires a rich soil and a good supply of moisture. It is not very sensitive to changes of light and is well suited for hall-ways or rooms not well heated. Like other plants, however, it thrives best in a uniform temperature.

Perhaps the most successful use of the Ivy is in the hanging basket. It may also be used for decorating picture frames, etc.

The Irish Ivy (Hedera Canariensis) is slightly larger than the English. Its leaves are 5-lobed. It will thrive in a cool, shady and close room. Too great exposure to the heat of the sun will cause the leaves to turn purple.

German Ivy (Senecio scandens)—This grows much more rapidly than the *Hedera*. It has lighter green leaves, is entirely free from insects and very easy to propagate.

Linaria cymbalaria (Coliseum or K-nikeworth Ivy).—Smaller, stems slender and purplish. Flowers small. It grows in cracks and crevices of old buildings. There are over 50 varieties of the above mentioned three kinds of Ivy.

(1). *Cobaea scandens (Polemoniaceæ)*—Named in honor of Coto, a Spanish priest who first described it. It is propagated either from seeds or cuttings. It requires a high degree of warmth, a light, rich soil and plenty of water.

(2). *The Passion Flower (Passiflora caerulea Passifloraceæ)*.—It thrives best in a light, fertile soil and requires plenty of sunlight. It is easily injured by over watering.

(3). *Morning Glory (Ipomœa)* $\left\{ \begin{array}{l} \text{Coccinea} \\ \text{limbata} \\ \text{hederacea} \end{array} \right\}$ *Convolvulaceæ*.

(4). *Smilax (Myrsiphyllum asparagoides) Liliacæ*—It is a bulb and requires a rich, sandy and rather moist soil to grow it to perfection. What are usually taken for *leaves of the Smilax* are simply metamorphosed branches.

(5). *Nasturtium (Tropæolum) Geraniacæ*—A large group of elegant growing, profuse blooming climbers. The four principal species are: *Tropæolum major*, *Tropæolum minus*, *Tropæolum lobianum*, *Tropæolum peregrinum*, (Canary Bird Flower)

Each *sp. civis* is divided into a large number of *varieties*.

(6). *Mauandia*.—An elegant climbing perennial belonging to the order *Scrophulariaceæ*. Named in honor of Dr. Maunandy, the botanical professor at Carthage. The most important species is *Mauandia Barclayana*.

(7). *Thunbergia*—An ornamental climber belonging to the order *Acanthaceæ*. Dedicated to Thunberg, a great botanical traveler.

CLIMBING VINES FOR THE BALCONY OR PIAZZA.

There are few ornamental plants more desirable than our hardy perennial climbers. They are invaluable for covering porches, arbors, old stumps, trees, walls, rocks, etc.

The following list comprises those best adapted to this climate:

1. Virginia Creeper or Am. Ivy (*Ampelopsis*) (*Vitacæ*.)
2. Wistaria (*Leguminosæ*.)
3. Honeysuckle (*Lonicera*) (*caprioliacæ*.)
4. The Trumpet Vine (*Bignonia*.)
5. The Trumpet Creeper (*Tecoma*.)
6. Dutchman's Pipe (*Aristolochia*)
7. Clematis (*Acnunculacæ*)
8. Akebia, *Lardizibabia*

The Japanese and climbing Roses might be added to this list. The above list of climbers are all hardy.

FLOWERING BULBS.

Botanically, a "bulb" is an enlarged underground stem, or a permanent bud with fleshy scales.

Though usually considered a root, it partakes more of the nature of a seed.

Structurally, bulbs are of three kinds:

1. The *coated* (Hyacinth) (Onion), etc.—Those which have wide scales folding around each other.

2. The *scaly* (Lily).—Which consist of narrow fleshy scales united at the base.

3. The *solid* (Gladiolus) (Crocus), etc.—Those consisting of a white solid farinaceous mass. *Popularly*, any solid, spherical, underground stem is called a “bulb.”

Bulbs may be divided into *two* geographical classes, viz: (1). Holland Bulbs; (2). Cape Bulbs. The *first class* comprises the Hyacinth, Tulip, Crocus, Snowdrop, Gonquil, Narcissus, Iris and Fritallaria.

The *second class* comprises Gladiolus, Amaryllis, Agapanthus, Oxalis, Nerine, Ixias, Tigridia.

THE HYACINTH.

Selection of Bulbs.—They should be clean, nearly spherical, hard and heavy, with smooth skin, not appearing scaly.

Size is no criterion of quality.—Single varieties are usually best.

Caution.—Do not buy cheap or “mixed” bulbs, neither those that are very high-priced on account of scarcity. *Good bulbs* cannot be had at much less than three dollars per dozen.

Flowering Bulbs.—A list of those suited for the window garden.

1. Tulip (*Tulipa*) (*Liliaceæ*).—Asia. There are numerous varieties, both single and double. The single are the handsomer. They are divided into three classes, viz.:

(a) *Bizzares*.—Ground color, yellow.

(b) *Rose*.—Variegated with crimson, pink and scarlet.

(c) *Byblomen*.—Marked with black, lilac, purple.

2. Narcissus.—A large genus of *Amaryllidaceæ*. The principal species are *N. pseudo*, *N. jonquilla*, *N. polyanthus*.

3. Crocus (*Iridaceæ*).—S. Europe.

4. Snowdrop (*Galanthus*) (*Amaryllidaceæ*).—Europe.

5. Iris (Flower de Luce) (*Iridaceæ*).—Species cultivated for ornament mostly from Europe.

6. Ranunculus and Anemone (*Ranunculaceæ*).

7. Cyclamen (*Primulaceæ*).—Europe.

8. Scilla (Squill) (*Liliaceæ*).—Europe.

9. Amaryllis (*Amaryllidaceæ*).—Africa.

10. Lily (*Lilium*) (*Liliaceæ*).—Asia.

11. Lilly of the Valley (*Convallaria*) (*Liliaceæ*).—Am.

12. Agapanthus (*Liliaceæ*).—S. Africa.

13. Tuberose (*Polyanthes*) (*Amaryllidaceæ*).—Africa.

The most important rule in *bulb-culture* is, grow the foliage well. The stronger and more vigorous the leaves, the stronger will be the bulb, and consequently the larger and finer the bloom.

Flowering bulbs are subject to few diseases, and insects seldom attack them.

A list comprising some of the least expensive and most easily managed plants for window culture:

Calla.

Cyclamen.

Chrysanthemums.

Chinese Primrose.

Fuchsia.

Hyacinth and other Bulbs.

Geraniums.

Heliotropes.

Pelargoniums.

Azaleas.

The above will grow freely and flower in a temperature of about 50 degrees at night, with 15 or 20 degrees higher during the day.

A list of plants somewhat more expensive, more difficult of cultivation and requiring a higher temper temperature :

Bourrardias.	Poinsettias.	Stephanotis.
Begonias.	Lycopodiums.	Orchids.
Euphorbias.	Tuberoses.	Ferns.

The above thrive best in a humid atmosphere. Temperature 60 degrees at night, with 15 or 20 degrees higher during the day.

OUT-DOOR FLOWER GARDENING.

I. *Extent and Condition of Grounds.*

Perhaps the greatest defect in American flower gardens is that they are too large, and not sufficiently cared for. No one should have more ground in an ornamental garden than he can keep in the very highest state of cultivation.

Excellence affords satisfaction and pleasure, while failure or a partial success is a source of mortification and pain.

THE LAWN.

Nothing adds more to the attractiveness of a home than a fine, well kept lawn, and the importance of "grasses" as agents of decoration and ornament can hardly be overrated.

Grass in the shape of a well kept lawn is one of the simplest and yet the loveliest element in every landscape scene.

The essential requisites for a perfect lawn may be divided into the four following heads :

1. *A deep, rich soil with a carefully prepared seed bed.*
2. *A proper selection of grasses.*
3. *Thorough mulching of the ground after seeding.*
4. *Frequent watering and mowing ; weeding when necessary.*

Good lawns are often spoiled by making unnecessary walks and drives, and by excessive planting of trees and shrubs. Grass will not grow thriftily in dense shade, and no lawn can look well cut up by numerous walks and drives.

Good lawn grasses must answer the following requirements :

1. *They should combine the finest possible leaf growth with a capability of renewal under constant cutting.*
2. *They should possess the power of intimate weaving one with the other so as to form a stiff sod.*
3. *The different varieties should grow with equal rapidity so as to preserve the same height.*
4. *They should occupy the ground so completely as to exclude all other plants.*

The seeding of a lawn should be done in early spring, the ground having been thoroughly prepared the previous autumn. After sowing the seed cover the surface an inch deep with fine stable manure. This is needed as shade and mulch.

If the work is well done, the lawn will look well by the last of June, and require cutting by that time. Some weeds will naturally appear. The annuals being frequently cut off cannot seed and will soon be killed. Perennials, like dock and plantain, should be removed by hand.

After experimenting with various mixtures of seed, we have found the following to give the most satisfactory results:

I. Mixture for Fine Lawns Frequently Mown.

June grass or Kentucky blue grass (<i>Poa pratensis</i>)	10 pounds.
Red-top (<i>Agrostis vulgaris</i>)	10 "
Perennial rye grass (<i>Lolium perenn</i>)	10 "
Rough meadow grass (<i>Poa trivialis</i>)	5 "
Timothy (<i>Phleum pratense</i>)	5 "
Sweet vernal grass (<i>Anthoxanthum odoratum</i>)	5 "
White clover (<i>Trifolium repens</i>)	5 "

The above mixture will be sufficient to seed an acre. If less ground is to be sown, use the seed in proportion.

It is frequently desirable to keep larger areas of land in the immediate vicinity of the house in the form of *lawn meadows*. Such grounds may be kept in fine order by mowing them several times during the season, and still yield good crops of hay. The following mixture of seed will prove satisfactory for such places:

II. Mixture for Permanent Lawn Meadows.

June grass or Kentucky blue grass (<i>Poa pratensis</i>)	10 pounds.
Red top (<i>Agrostis vulgaris</i>)	10 "
Timothy (<i>Phleum pratense</i>)	5 "
Perennial rye grass (<i>Lolium perenne</i>)	5 "
Rough meadow grass (<i>Poa trivialis</i>)	5 "
Red clover (<i>Trifolium pratense</i>)	5 "
White clover (<i>Trifolium repens</i>)	5 "

The above notes regarding the lawn are copied from the third annual Station report.

SELECTION OF FLOWER SEED.

Make out your order *early*, and be careful to have it full and clear. *Send to none but reliable seedsmen.*

As a rule, sow only fresh seed. Don't order more than you use each year.

If unacquainted with the best seedsmen, it is a good plan to order from several. Give the seeds a fair, impartial trial, and note results.

DESIGNS FOR FLOWER BEDS.

There are *four* well defined systems of planting flower gardens, viz.:

1. *Promiscuous or mixed.*
2. *Massing.*
3. *Ribbon style.*
4. *Carpet style.*

The first has many advocates but seems to be rapidly disappearing. When adopted care should be taken to so arrange the plants that the tallest shall be at the back of the bed, if this is against the fence, wall, or back ground of shrubbery. In open beds on the lawn the tallest should be in the center, the others grading down to the front on all sides.

The following dwarf plants are suitable for edgings or borders: *Alternanthera*, *Armeria* or *Thrift*, *Pyrethrum aureum*.

White-leaved plants—*Glaucium*, *Centaurea*, *Cineraria maritima*.

Massing is the planting of a single variety either in large or small beds.

The following named plants are suited for planting in "masses" or "ribbon" lines. They are named as nearly as possible in the order of their height, number one in each case being the tallest.

The outline of a "ribbon bed" should form a regular slope from the centre or highest point, down to the front or lowest point.

List, No. 1—

1. *Canna Indica zebrina.*
2. *Salvia splendens.*
3. *Coleus* (Golden Bedder).
4. *Coleus* (Hero).
5. *Centaurea candida* (Dusty Miller).
6. *Alternanthera lalifolia.*

List, No. 2—

1. *Caladium esculentum.*
2. *Coleus verschaffeltii.*
3. *Diplinum bicolor* (Larkspur).
4. *Cyperus alternifolius.*
5. *Acyranthes verschaffeltii.*
6. *Geranium* (Mountain of Snow).

List, No. 3—

1. *Ricinus* or *Canna.*
2. General Giant *Geranium.*
3. *Centaurea candida.*
4. *Golden Pyrethrum.*

List No. 1 and 2 are suitable for beds having a diameter of 10 feet and upwards. No. 3 is suitable for a bed from 5 to 12 feet in diameter.

The Carpet Style.—A great variety of succulent plants are used, such as *Echeveria*, *Sedums*, *Sempervivums*, *Mesembryanthemums*, etc., etc., together with numerous low growing Alpine plants, such as *Ajagas*, *Cerastiums*, *Lysimachias*, *Lobelias*, *Alternantheras*, etc., etc.

Not a leaf of these plants are allowed to grow more than six inches above the lawn. Planting in this style admits of almost unlimited variety in the form of the beds, and contrasts of colors. Strips of colored paper giving the exact tints of the leading flowers and foliage are very useful in arranging designs for "ribbon" or "carpet" planting.

CLASSIFICATION OF FLOWERING PLANTS.

The plants of the out door flower garden, besides shrubs, trees, etc., may be divided into *Annuals*, *Biennials*, *Herbaceous Perennials* and *Bulbous*.

Annuals flower the first season, perfect their seed and then die. Many varieties grown as *Annuals* in a northern climate are either *Biennials* or *Perennials* in their southern home.

Annuals flower in a few weeks or months after the seeds are sown and usually make a brilliant show. In our climate *Annuals* may be classed as *Hardy*, *Half Hardy* and *Tender*.

Hardy Annuals, like *Petunias*, *Candytuft*, etc., may be sown in the open ground in autumn or very early in the spring.

The Half Hardy are those like the *Balsam*, *Marigold*, etc., which cannot be sown in the open ground until all danger from frost is over.

Tender Annuals must be started in a green-house or hot-bed to bring them to perfection and should not be transplanted to the open ground until the weather

is quite warm. The Cypress Vine (*Ipomœa*) and Sensitive Plant (*Mimosa*) are good examples.

Biennials are those that flower the second season after the seed is sown and then die, unless special care be taken to preserve them.

Herbaceous Perennials are plants which die down to the ground every autumn, but the roots continue to live and new branches and flower stems are thrown up for many years.

Bulbous Plants are divided into *Hardy* and *Tender*. The former includes all that will bear a northern winter. The latter are those that will not bear freezing and must be planted in spring.

LIST OF ANNUAL FLOWERING PLANTS,

comprising generally well known and favorite kinds, such as are of easiest cultivation, and are most valued for the beauty and fragrance of their flowers:

Asters.	Dianthus.	*Nasturtium.
Balsams.	Escholtzia.	Pansy.
Candytuft.	Globe Amaranths.	Petunia.
Cannas.	Ice Plant.	Phlox Drummondii.
*Canary Bird Flower.	*Ipomœa.	Poppy.
Clarkias.	Lobelia.	Portulaca.
Cockscombs.	Lupines.	Scabiosa.
Collinsia.	Lychnis.	Schizanthus.
*Convolvulus.	Marigolds.	Sweet Peas.
*Cypress Vine.	Mignonette.	Stocks.
Delphiniums.	Mimosa.	Zinnias.

Those marked * are Climbers.

In the above list the popular and scientific names are used indiscriminately, just as they are found in most florists' catalogues.

Purchase few "novelties" until you know their merits have been tested.

LIST OF HARDY HERBACEOUS PERENNIALS.

Aconitum (Monkshood).	Mertensia (Lungwort).
Aquilegia (Columbine).	Myosotis (Forget-me-not).
Asperula (Spireæ?).	Narcissus { Jonquil.
Campanula (Harebell).	{ Daffodil.
Clematis (Clematis).	Cœnothra (Eve. Primrose).
Colchicum (Saffron).	Pæonia (Pæony).
Convallaria (Lily of the Valley).	Papaver (Poppy).
Delphinium (Larkspur).	Pentstemon (Penstemon).
Dicentra (Bleeding Heart).	Phlox { Moss Pink.
Dictamnus (Fraxinella).	{ French Lilac.
Funkia (Day Lily).	Polemonium (Jacob's Ladder).
Helleborus (Chris. Rose).	Primula (English Cowslip).
Iberis (Candytuft).	Pyrethrum (Pyrethrum).
Iris (Flower de Luce).	Saxifraga (Saxifrage).
Liatris (Blazing Star).	Sedum (Stone Crop).
Lilium (Lily).	Sempervivum (House Leek).
Linum (Per. Flax).	Spiræa (Spiræa).
Lobelia (Card. Flower).	Symphytum (Comfrey).
Lupinus (Lupine).	Thalictrum (Meadow Rue).
Lychnis (Lychnis).	Yucca (Bear Grass).

Bedding Plants is a general term given to herbaceous plants which are winter inhabitants of the green house or window garden, but which if planted out in the open ground during late spring or early summer bloom profusely until the approach of frost in the autumn. As a rule, they are perennials, but among them are many plants which bloom late in the summer, from seed sown in the open ground the previous spring. There is a long list of these plants. Among the most important are: Verbenas, Geraniums, Chrysanthemums, Coleus, Centaurea, Achyranthus, Caladiums, Cannas, Ricinus, Dahlias, Pyrethrum, or Feverfew, Alternanthera.

THE ROSE.

Garden Classification.—Roses may be divided into three general classes:

1. *Those that bloom only once in the season.* This class includes the French, Hybrid China, Provence, Sweet Brier, Moss, Scotch and all the *climbing* varieties that are hardy in this latitude.

2. *Those that make distinct and separate periods of bloom.* This class is called Damask, Hybrid Perpetuals, or Remontants.

It is probably the most interesting class of Roses, embracing many hundred varieties, most of which are hardy, although some require winter protection.

3. *Those that bloom continually without any temporary cessation,* hence called Monthly or Ever-blooming Roses.

This class comprises at least four well marked sub classes, viz.: Tea, Noisette, Bourbon and Bengal.

All of the third class are tender and unless well protected are either killed outright or cut down to the roots by the frost in winter.

Tea Roses are of slender growth and tea-scented.

Noisettes are rampant growers and flower in clusters.

Bourbon varieties are characterized by their large and double flowers.

Bengal by the absence of all orange or yellow shade of color.

ROSE CULTURE.

Location.—Select the best place in the flower garden—one that is or may be protected from bleak, sweeping winds. A warm, sunny position is also requisite.

Soil.—Roses will do well in any ordinary garden soil well drained and free from stagnant water.

Fertilizers.—These must be applied generously if we expect a generous yield of flowers. Stable manure, bone dust, soot and guano are all valuable.

Pruning should be done in November or March.

Protection.—*Mulching* is necessary to prevent injury from drouth and from frost. *Pegging down* is necessary to prevent certain varieties from winter-killing.

The following are the essential requisites of a perfect Rose:

1. Beauty of color	6 points.
2. Beauty of form	5 “
3. Fragrance	4 “
4. Profusion and continuity of bloom	3 “
5. Vigor and healthfulness of growth	2 “

Total 20 points.

ORNAMENTAL SHRUBS.

Grounds are seldom so small that a few choice shrubs cannot appropriately find room, while for larger places they are indispensable to its proper ornamentation.

The following list embraces some of the leading kinds. For the others reference may be made to the catalogues of the principal nurseries:

<i>Amygdalus nana</i> ,	Flowering Almond.
<i>Berberis vulgaris</i> , (Var.)	Purple Barberry.
<i>Calycanthus Floridus</i> ,	Sweet Scented Shrub.
<i>Chicnanthus Virginica</i> ,	Fringe Tree.
<i>Deutzia</i> , (Varieties)	Deutzia.
<i>Euonymus atropurpureus</i> ,	Burning Bush.
<i>Forsythia viridissima</i> ,	Golden Bell.
<i>Hibiscus syriacus</i> ,	Rose of Sharon.
<i>Hydrangea</i> , (Vars)	Hydrangea.
<i>Lonicera</i> ,	Tartarian Honeysuckle.
<i>Magnolia</i> , (Vars)	Magnolia.
<i>Pinus adelphus</i> , (Vars.)	Mock Orange.
<i>Ribes aureum</i> ,	Missouri Currant.
<i>Syringa</i> , (Vars.)	Lilacs.
<i>Spiræa</i> , (Vars.)	Spiræas.
<i>Viburnum</i> , (Vars.)	Snowball.
<i>Weigela</i> , (Vars.)	Bush Honeysuckle.
<i>Azalea Pontica</i> ,	Belgian Azalea.
<i>Cercis Japonica</i> ,	Japan Judas Tree.
<i>Pyrus Japonica</i> ,	Japan Quince.
<i>Prunus triloba</i> ,	Flowering Plum.
<i>Symphoricarpos</i> ,	Snowberry.
<i>Cystus elongatus</i> ,	Laburnum.

HARDY EVERGREEN SHRUBS.

<i>Andromeda floribunda</i> ,	Andromeda.
<i>Buxus sempervirens arborea</i> ,	Tree Box.
<i>Biota orientalis</i> ,	Eastern Arbor Vitæ.
<i>Daphne Cneorum</i> ,	Garland Flower.
<i>Ilex opaca</i> ,	American Holly.
<i>Juniperus</i> , (Varieties)	Juniper.
<i>Kalmia latifolia</i> ,	American Laurel.
<i>Podocarpus Japonica</i> ,	Japan Yew.
<i>Retinospora obtusa</i> ,	Obtuse leaved Retinospora.
<i>Retinospora plumosa aurea</i> ,	Golden-plumed Retinospora.
<i>Rhododendron catawbiense</i> , (hybrids)	Rhododendron.
<i>Taxus baccata</i> , var. <i>Canadensis</i> ,	American Yew.
<i>Taxus baccata erecta</i> ,	Upright Yew.
<i>Thuja</i> , (Varieties)	American Arbor Vitæ.

HARDY EVERGREEN TREES OF MEDIUM SIZE.

<i>Abies Canadensis</i> ,	Hemlock Spruce.
<i>Abies excelsa</i> ,	Norway Spruce.
<i>Abies excelsa Gregoryana</i> ,	Gregory's Spruce.
<i>Abies excelsa pygmæa</i> ,	Dwarf Spruce.
<i>Abies excelsa inverta</i> ,	Inverted Spruce.
<i>Abies nigra pumila</i> ,	Dwarf Black Spruce.
<i>Abies Fraseri</i> , var. <i>Hudsonica</i> ,	Hudson's Bay Fir.
<i>Abies pectinata</i> ,	European Silver Fir.
<i>Abies Pichta</i> ,	Siberian Silver Fir.
<i>Juniperus Virginiana</i> ,	Red Cedar.

<i>Pinus strobus</i> ,	White Pine.
<i>Pinus cembra</i> ,	Swiss Stone Pine.
<i>Pinus pumilio</i> ,	Dwarf Pine.
<i>Pinus Austriaca</i> ,	Austrian Pine.

For screens and wind-breaks there is nothing equal to the *Austrian Pine* and *Norway Spruce*.

For a low hedge or border the *Hemlock Spruce*, *American Arbor Vitæ* and *Norway Spruce* are best.

VASES, ROCK-WORK, ETC.

Nothing is more effective as an adornment of the lawn or flower-garden than a *well kept vase*. Most of the vigorous growing ornamental leaved plants are appropriate for the top or center of the vase.

Plants of a lower or drooping habit should be placed near the edges.

The Verbena and Petunia are among the best plants for this purpose.

As every side of a vase is exposed to air and sun the evaporation is very great, and they must receive an abundance of water in order to keep the plants in good condition.

ROCKERY.

This is usually constructed of rough stones, tastefully arranged with soil sufficient for the growth of plants suitable for such a place.

"Artificial rock-work" can be made by collecting the clinkers from furnaces, and dipping them in a hot-lime wash which gives a coloring of pure white. Upon this plants with bright colors are the most suitable, such as Verbenas, Coleus, Scarlet Geraniums, Lobelias, Lysimachia, etc.

Rockwork may often be used to advantage in forming screens.

Grounds where rocks exist in their natural condition can be made very ornamental by setting out plants of a drooping, trailing or climbing habit.

Those best suited for this purpose are:

Achilleas.	Phloxes.	Sempervivums.
Campanulas.	Orobis.	Soldanella.
Cerastium.	Polemonium.	Vinca.
Linnaea.	Saxifragas.	Thymus.
Lychnis.	Sedums.	Violas.
Lysimachia.		

FLORAL DECORATIONS.

The art of arranging flowers gracefully is not so easily taught as their culture, for it requires an artistic eye to group them tastefully.

Placing flowers loosely and naturally in vases and other ornamental receptacles is a simple matter, requiring only good taste and some knowledge of the harmony of colors.

Many a vase or bouquet of flowers is ruined by mingling too many kinds and too great a variety of colors. Two or three purple flowers in a vase of scarlet and white will destroy the whole effect.

Preservation of Cut Flowers.—Hot water will frequently restore flowers to freshness, even when every petal is drooping. Place the stems into a cup of boiling hot water and leave them until the petals become smooth. Then cut off the cooked ends and put into luke-warm water.

A Wardian case or a cool room is best adapted to keeping flowers fresh. They will wilt quickly in badly ventilated rooms, especially if filled with

tobacco smoke. Take away each flower as it fades, else it will cause the others to decay.

It is far better to gather a large portion of your flowers for yourself and friends than to allow them to fade on the plants.

SUMMING UP.

The cultivation of flowers is an occupation that improves alike the body, mind and heart. It is an almost certain indication of purity and refinement.

To become skillful in the art requires study, observation and experience. It is not a rude, simple matter, but requires and rewards the fullest command of science and the amplest knowledge of Nature's laws.

The difficulties of floriculture only enhance its pleasures, for whatever is worth having is worth working for.

Blight, drouth, frost, mildew, hail, flood, insects may make, for a time, your flowering plants a sorrow and a vexation; but those who love them will persevere through every discouragement and triumph over every obstacle—rejoicing all the more because their flowers are the reward of honest, faithful, persistent work.

What we need in floriculture is more study, more thought, more enthusiasm, with less blind devotion to old ways, methods and practices, which, if ever desirable and judicious, have long ceased to be so. If those who love floriculture will intelligently resolve that it shall and must improve, it will not be long till we have an art worthy of our country and worthy of the age in which we live.

REPORT ON GRASSES.

MEADOW FOX-TAIL (*Alopecurus pratensis*).

This grass has been growing in our experiment plots since the spring of 1883. It has stood the winter remarkably well, making a rapid growth in early spring before other varieties have scarcely started. In general appearance it resembles Timothy, but is much earlier and not nearly so large when mature. It promises to be a valuable early pasture grass and may also show considerable value for hay. We intend sowing it in a plot large enough to test its value in a practical manner. Height about 40 inches. In bloom May 10, 1884 and May 20 in 1885, the severe winter making it somewhat later in starting the latter year. Ripe June 2 and 10 for the two years respectively.

TIMOTHY (*Phleum pratense*).

This species is so well known that special notes are unnecessary. It forms the bulk of the cultivated grass over a large part of our country. Blooms here June 20 to 30. Varies from three to four feet in height. The variety mentioned before this is much more valuable, both for early and for late pasture.

RED TOP (*Agrostis vulgaris*).

Extensively cultivated as a pasture grass, not much esteemed for hay, but is of fair quality when cut before the seed hardens. Is quite hardy and stands pasturage well. Two and one half to 3 feet tall here. It blooms about June 20. Not equal to Blue Grass. Appears to flourish best on low, moist soil.

CREEPING BENT (*Agrostis stolonifera*).

Closely related to the previous species, but of smaller growth. After a fair trial we regard it as practically valueless as an agricultural grass in central Ohio where so many better kinds will do well. About 12 inches high. Blooms about June 25.

BROWN BENT (*Agrostis canina*).

Resembles previous species, except in stronger growing. Of some value as a pasture grass, but scarcely worthy the attention of the farmers of Ohio. It ranges from 15 to 18 inches tall. Blooms about June 20.

ORCHARD GRASS (*Dactylis glomerata*).

This is doubtless one of the oldest and most widely cultivated of grasses, yet it is a stranger on a great majority of the farms of Ohio. In the last few years it has been introduced in several localities in the State. Either from lack of proper attention to its habits of growth or from a disposition to regard with disfavor innovations in the nature of new grasses, it has not become as popular as it deserves. It has a peculiar habit of growing in decidedly prom-

inent tufts or bunches, and when sown alone much of the land is likely to be unoccupied. Unlike timothy, our standard meadow grass, it *must be cut* before the seed hardens or its value for hay is very much impaired. Sown with common red clover it makes an excellent meadow, and they both come to the proper degree of maturity for cutting at the same time, or nearly so, which is immediately after full bloom. It can also be sown with red top or some other grasses with good results, but for a hay crop we much prefer it with clover. This grass starts early in the spring, but little later than meadow fox-tail, and makes a good pasture if sown in mixture so as to secure a good sod. Its aftermath is excellent, much better than timothy, there being a strong growth of heavy radicle leaves. It will doubtless grow better in the shade than any other cultivated grass, except rough-stalked meadow grass (*Poa trivialis*). It can be mowed twice for hay in this latitude, but the best results are secured by pasturing it moderately after the first cutting. It grows from 3 to 3½ feet high. Comes into bloom June 2. Ready for haying June 12. This grass was slightly injured by the past very severe winter.

BLUE GRASS (*Poa pratensis*).

June Grass, Kentucky Blue Grass, Spear Grass. This is a well known grass to which is applied different names in different localities and of which there are several varieties. It is the most important of our pasture grasses and has considerable value for hay, if cut in proper season. Its place, however, is decidedly in the pasture. It is regarded as quite a pest among cultivated crops in some sections of the State. It is thoroughly hardy and also withstands drouth better than most grasses. Its habit of spreading by rhizomas or root stalks enables it to encroach upon other cultivated grasses, as timothy, and finally entirely supersede them. It grows from 24 to 30 inches tall. Blooms about June 1.

FOWL MEADOW (*Poa serotina*).

Is quite common in the northern States, but has little agricultural value alone. Associated with other grasses in pastures it adds to the density of the sward. It makes good hay, but from our experience its yield would not be sufficient to warrant its cultivation for a hay crop. Does well in moist ground. It is 2½ to 3 feet tall. Blooms the last of June.

ROUGH-STALKED MEADOW (*Poa trivialis*).

This species resembles *Poa pratensis*, except that it has fibrous roots and has not the root stalk of the latter. There are some other points of difference by which it can be readily distinguished. Its chief value is for shaded lawns and pastures, especially in low situations. It has never been cultivated alone to any extent. It doubtless is a valuable variety to mix with others for sowing pastures. With us it has been hardy, making a very fair growth. It ranges from 2 to 2½ feet high. In full bloom from June 5 to 10.

WOODS GRASS (*Poa alsodes*).

Not much is said of this grass by agricultural writers. It is found on mountain sides and is said to grow well in cool, shaded places. Here, at the Station, it made a very unsatisfactory growth. It attained a height of 20 inches. Appears to have little, if any, value. Is probably of some importance for woodland pastures. Ripened here about June 15 to 20.

MEADOW FESCUE (*Festuca elatior*).

A very common meadow grass of Europe, and now being introduced into the meadows of this country. We believe from our experience with it for the past three years that it is a very promising meadow grass. The Station confidently recommends it as worthy of trial. It seems perfectly hardy, produces an abundant crop, and its after math is good.

In the South it is sometimes called "evergreen grass," and seems to be growing in general favor. At the Station it covered the ground quite well. Grows from 3 to 3½ feet tall. Blooms June 15 to 18.

Meadow Fescue is sometimes called English blue grass.

RESCUE GRASS (*Bromus unoloides*).

This species is not much known as a meadow grass, being cultivated only sparingly and mainly at the South. This is on account of its supposed inability to withstand low temperatures. It was all killed, but a few spears, at the Station the first winter, 1883, but the next year it stood quite well and this last season had thickened up so as to make a strong, vigorous plot. It made a very rank growth during the last spring and produced a very large amount of forage.

The Station is quite interested in it, and if it continues hardy it will be given a more extended trial. It grows from 3 to 3½ feet tall. Blooms about June 20.

This species belongs to the same genera as chess or cheat.

RYE GRASS (*Lolium perenne*).

There are several species of the ray or rye grass of which *Lolium Italicum*, Italian rye grass, is the most important. The *Loliums*, and especially the one last named, are very popular in England, perhaps as much as timothy is here. In England it is a perennial, and a valuable hardy grass. At the Station it has never withstood our winters so that we could tell much about its value. It has been repeatedly sown, and has made excellent growth during the summer, but when it stands alone is entirely too tender for our severe winters. A variety called Pacey's rye grass is one of the most promising.

TALL OAT GRASS (*Arrhenatherum avenaceum*).

But little is said of this grass by agricultural writers of this country. It is mentioned as promising in some sections of the South. In Europe it is regarded as quite an important member of the grass family. It has been perfectly hardy at the Station where it has been growing for the past three years. It makes an abundant, early growth, and it apparently well adapted to grazing.

The Station recommends it as well worthy of trial. The coming season it will be sown in larger plots in order more fully to test its merits. It grows from three to four feet tall. Blooms here June 1 to 10. Ripens its seed about the 20th.

JOHNSON'S GRASS (*Sorghum halapense*).

This species has been known under several names, as Cuba grass. Mean's grass, Evergreen Millet, etc. It belongs to the same genus as sorghum sugar cane (*Sorghum vulgare*). It has been cultivated for a long time in several localities in the South, and has been received generally with favor. Some complain of its persistency, it being quite difficult to eradicate when once thoroughly established.

This grass has received considerable attention of late in the agricultural press.

The Station has not tested it long enough to speak confidently in regard to its hardiness. So far as tried it does not appear able to stand the Northern winters.

From our tests it seems to be decidedly inferior to common millet as a forage plant. It grows here 4 to $4\frac{1}{2}$ feet tall. Ripens about the 1st of August.

For two years past the Station has tested on small plots upward of one hundred distinct species and varieties of grass. Only a few of these have proved to be of sufficient value, in this soil and climate, to merit any further trial. Some appear to have unquestioned merit, and all such will be tested further before any report is made.

The list of varieties has been largely increased the present spring through the courtesy of the United States Department of Agriculture.

It is the hope and expectation of the Station that among the numerous varieties now on trial some may be found of great and permanent value. Among those which seem to promise the most is the Texas Blue Grass (*Poa arachnifera*). This species is a native of Arkansas, and appears to have great prospective value as a grass for winter grazing.

BOTANICAL NOTES.

A series of interesting botanical notes regarding the time of blooming, rapidity of growth, size, etc., of different plants have been collected by the different officers of the Station during the past year. Lack of space forbids the publication of these in the present report. Some of the more important of these notes will be published in the form of a bulletin at an early day.

PLANTS IDENTIFIED.

There appears to be a growing interest throughout the State in the subject of practical botany. The number of specimens of plants sent to the Station for identification and history, and the number of inquiries concerning plants of various kinds, have greatly increased the past season.

The number of specimens received during 1885, is more than double the whole number received the three years preceding.

The total number of plants examined and identified was 275, embracing 184 distinct species, and 45 different families or orders. These plants have come from all parts of Ohio, and from six other States.

Since the organization of the Station, specimens for identification have been received from twenty-two different States and Territories, also from Manitoba and Ontario, Canada. The larger share of the inquiries were concerning weeds, next, grasses and forage plants. Honey producing plants, poisonous plants, medicinal plants, etc., were also subjects of inquiry.

The following list includes those that were examined and reported upon the past year. This part of the Station work was performed almost wholly by the Botanist, Mr. W. S. Devol:

LIST OF PLANTS—IDENTIFIED.

Botanical Name.	Common Name.
<i>Clematis Virginiana</i> , L	Virgins Bower.
<i>Ranunculus acris</i> , L.....	Buttercups. Tall Crowfoot.
<i>Anemone Virginiana</i> , L	Virginian Anemone.
<i>Argemone Mexicana</i> , L	Mexican Prickly Poppy.
<i>Viola cucullata</i> , Ait	Common Blue Violet.
<i>Cardamine rhomboidea</i> , D. C., var. <i>purpurea</i> , Torr.....	Bitter Cress.
<i>Capsella Bursa-pastoris</i> , Moench	Shepherd's Purse.
<i>Lepidium Virginicum</i> , L.....	Tongue Grass. Pepper Grass.
<i>Camelina sativa</i> , Crantz	
<i>Hypericum perforatum</i> , L.....	Common St. John's Wort.
<i>Stellaria media</i> , Smith.....	Common Chickweed.
<i>Cerastium oblongifolium</i> , Torr	Mouse-ear Chickweed.
<i>Mollugo verticillata</i> , L	Carpet Weed.
<i>Malva rotundifolia</i> , L.....	Low Mallow. Cheeses. Round-leaved M.
<i>Abutilon avicennae</i> , Gaertn	Velvet Weed. Indian Mallow, etc.
<i>Sida spinosa</i> , L.....	Spiny Sida.
<i>Rhus toxicodendron</i> , L	Poison Ivy. Poison Oak.

<i>Ceanothus Americanus</i> , L	Jersey Tea. Red Root.
<i>Trifolium avense</i> , L	Rabbit-foot. Stone Clover.
<i>Trifolium pratense</i> , L	Red Clover.
<i>Trifolium stoloniferum</i> , Muhl.	Running Buffalo Clover.
<i>Trifolium procumbens</i> , L	Low Hop Clover.
<i>Medicago lupulina</i> , L	Black Medick. Nonesuch.
<i>Desmodium illinoense</i> , D.C.	Bush Trefoil. Tick Trefoil.
<i>Lespedeza repens</i> , Torr. & Gray	Creeping Bush Clover.
<i>Cassia Marilandica</i> , L	Wild Senna.
<i>Cæsalpina Bonduc</i> , Benth. & Hook	"Ponceanna."
<i>Cæsalpina Gilluerti</i>	Cæsalpina.
<i>Agrimonia parviflora</i> , Ait	Small-flowered Agrimony.
<i>Argemone eupatoria</i> , L	Common Agrimony.
<i>Geum album</i> , Gmelin	Avens.
<i>Potentilla Canadensis</i> , L	Five-Finger. Common Cinque-foil.
<i>Potentilla Norvegica</i> , L	Cinque-foil.
<i>Potentilla arguta</i> , Pash	Cinque-foil.
<i>Rosa Carolina</i> , L	Swamp-Rose.
<i>Henckera Americana</i> , L	Common Alum-root.
<i>Penthorum sedvides</i> , L	Ditch Stone-crop.
<i>Circæa Luteiflora</i> , L	Enchanter's Nightshade.
<i>Salicaria elongata</i> , Muhl.	Willow-herb.
<i>Oenothera biennis</i> , L	Evening Primrose. Yellow Primrose.
<i>Najas verticillata</i> , H. B. K.	Swamp Loosestrife.
<i>Cuphea viscosissima</i> , Jack	Cuphea.
<i>Sanicula Marylandica</i> , L	Sanicle. Black Snake-root.
<i>Daucus carota</i> , L	Wild Carrot.
<i>Archangelica hirsuta</i> , Torr. & Gray	Hairy Archangelica.
<i>Cryptotaenia Canadensis</i> , D.C.	Honewort.
<i>Erigenia bulbosa</i> , Nutt	Harbinger-of-Spring.
<i>Lonicera ciliata</i> , Muhl	Fly Honeysuckle.
<i>Triostema perfoliatum</i> , L	Fever-wort. Horse Gentian.
<i>Galium triflorum</i> , L	Small Bedstraw.
<i>Galium triflorum</i> , Michx	Three-flowered Bedstraw.
<i>Cephalanthus occidentalis</i> , L	Button-bush.
<i>Dipsacus sylvestris</i> , Mill	Wild Teasel.
<i>Vernonia noveboracensis</i> , Wild	Iron Weed.
<i>Eupatorium perfoliatum</i> , L	Boneset. Thoroughwort.
<i>Eupatorium ageratoides</i> , L	White Snakewort.
<i>Aster cordifolius</i> , L	Heart-leaved Aster.
<i>Aster erioideus</i> , L	Small-leaved Aster.
<i>Aster erioideus</i> , L., var. <i>villosus</i> , Gray	Soft-hairy Aster.
<i>Aster missouriensis</i> , L	Starved Aster.
<i>Aster cerneus</i> , Née	Pale Aster.
<i>Aster pulchellus</i> , L	Bright Aster.
<i>Aster prenanthoides</i> , Muhl	Prenanth-like Aster.
<i>Aster noveboracensis</i> , L	New England Aster.
<i>Erigeron Canadensis</i> , L	Horse-weed. Butter-weed.
<i>Erigeron annuus</i> , Pers.	Daisy Fleabane. White-weed.
<i>Erigeron strigosus</i> , Muhl.	Daisy Fleabane.
<i>Solidago Canadensis</i> , L	Golden-rod.
<i>Solidago gigantea</i> , Ait	Great Golden-rod.
<i>Solidago laevis</i> , Ait	Lance-leaved Golden-rod.
<i>Polyunia Canadensis</i> , L., var. <i>discoides</i> , Gray	Leaf-cap.
<i>Xanthium strumarium</i> , L	Common Cockle-bur.
<i>Heliopsis scabra</i> , Pers.	Ox-eye.
<i>Heliopsis scabra</i> , Pers., var. <i>scabra</i> , Gray	Rough Ox-eye.

- Rudbeckia laciniata*, L.....Cone-flower.
Rudbeckia hirta, L.....Yellow Daisy. Rough *Rudbeckia*.
Actinomeris squarrosa, Nutt.....Actinomers.
Pidens bipinnata, L.....Spanish Needles.
Achillea millefolium, L.....Common Yarrow. Mil-foil.
Chrysanthemum leucanthemum, L.....Ox-eye Daisy.
Gnaphalium polycephalum, Mich.....Common Everlasting.
Antennaria plantaginifolia, Hook.....Plantain-leaved Everlasting.
Cirsium lanceolatum, Scop.....Common Thistle. Horse Thistle.
Cirsium discolor, Spreng.....Plumed Thistle.
Cirsium arvense, Scop.....Canada Thistle. Cursed Thistle.
Nabalus Fraseri, DC.....Lion's-foot. Gall-of-the-Earth.
Nabalus crepidineus, DC.....Rattlesnake-root.
Lactuca Canadensis, L.....Wild Lettuce.
Mulgedium leucophæum, DC.....False Wild Lettuce.
Sonchus asper, Vill.....Spiny-leaved Sow-Thistle.
Chamalatia foliolosa.....Chamalatia.

Lobelia syphalítica, L.....Great Lobelia.
Lobelia, —.....Lobelia.
Campanula Americana, L.....Tall Bellflower.

Plantago major, L.....Common Plantain.
Plantago lanceolata, L.....Ribgrass. Buck Plantain. English Plantain.
Plantago aristata, Michx.....Bearded Plantain.

Lysimachia quadrifolia, L.....Four-leaved Loosetrife.
Lysimachia ciliata, L.....Loosetrife.
Lysimachia lanceolata, Walt.....Lance leaved Loosetrife.

Tecoma radicans, Juss.....Trumpet Creeper.

Epiphegus Virginiana, Bart.....Beech-drops.

Linaria vulgaris, Mill.....Toad-flax. Butter-and eggs.
Scrophularia nodosa, L.....Figwort.
Veronica peregrina, L.....Neckweed. Purslane Speedwell.
Gerardia, —.....Gerancia.
Pedicularis lanceolata, Michx.....Lousewort.

Teucrium Canadense, L.....American Germander.
Lycopus Europæus, L.....Water Horehound.
Lycopus Europæus, L., var. *integrifolius*, Gray.....Water Horehound.
Lopanthus nepetoides, Benth.....Giant Hysop.
Brunella vulgaris, L.....Common Self-heal. Blue Curls.
Scutellaria lateriflora, L.....Mad-dog Skull-cap.
Stachys palustris, L., var. *asper*, Gray.....Hedge-nettle.
Leonurus cardiaca, L.....Common Motherwort.

Verbena hastata, L.....Blue Vervain.
Verbena urticifolia, L.....Nettle-leaved Vervain. White Vervain.
Phyrma Leptostachya, L.....Lopseed.

Lithospermum, —.....Puccoon. Stone-seed.
Lithospermum arvense, L.....Wheat Thief. Pigeon-weed. Ccrn Grounwell.
Cynoglossum Morisoni, DC.....Beggar's Lice. Suck-tight.

Phacelia Purshii, Buckley.....Miami Mist.

Ipomœa pandurata, Meyer.....Wild Potato-vine. Man-of-the-Earth.
Calystegia sepium, R.Br.....Hedge Bind-weed. Rutland Beauty.
Cuscuta epilinum, Weihe.....Flax Dodder.

Solanum Carolinense, L.....Horse Nettle. Sand Brier.

Gentiana Andrewsii, Griseb.....Closed Gentian.

Apocynum androsæmifolium, L.....Spreading Dogbane

<i>Ligustrum vulgare</i> , L.....	Common Privet.	Prim.
<i>Chenipodium album</i> , L.....	Lamb's-quarters.	Pig-weed.
<i>Beta vulgaris</i> , L., var. <i>cicla</i> , Wood.....	Chard.	Scarcity.
<i>Amarantus retroflexus</i> , L.....		Pig-weed.
<i>Amarantus albus</i> , L.....		Green Amaranth.
<i>Amarantus spinosus</i> , L.....		Thorny Amaranth.
<i>Polygonum Virginianum</i> , L.....	Virginian Knot-weed.	
<i>Polygonum aviculare</i> , L.....	Knot-grass.	Goose-grass.
<i>Polygonum convolvulus</i> , L.....	Black Bind-weed.	Knot Bind-weed.
<i>Polygonum dumetorum</i> , L.....	Climbing False Buckwheat.	
<i>Rumex acetosella</i> , L.....	Field Sorrel.	Sheep Sorrel. Sour-grass.
<i>Euphorbia maculata</i> , L.....		Spotted Spurge.
<i>Euphorbia hypericifolia</i> , L.....		Hypericum-leaved Spurge.
<i>Euphorbia cyparissias</i> , L.....		Cypress Spurge.
<i>Acalypha Virginica</i> , L.....		Three-seeded Mercury.
<i>Smilax hispida</i> , Muhl.....		Cat-brier.
<i>Juncus tenuis</i> , Willd.....		Slender Rush.
<i>Cyperus phymatoides</i> , Muhl.....		Galingale.
<i>Cyperus strigosus</i> , L.....		Nut-grass.
<i>Scirpus divaricatus</i> , Ell.....		Sprangly Bullrush.
<i>Scirpus tentaculata</i> ,		Tentacled Bullrush.
<i>Scirpus eriophorum</i> , Michx.....		Wool-grass.
<i>Carex Grayii</i> , Carey.....		Gray's Sedge.
<i>Agrostis vulgaris</i> , With.....	Red-top.	Herd's-grass.
<i>Cinna arundinacea</i> , L.....		Wood Reed-grass.
<i>Muhlenbergia sobolifera</i> , Trin.....		Drop-seed Grass.
<i>Muhlenbergia Mexicana</i> , Trin.....		Mexican Wood-grass.
<i>Muhlenbergia Willdenovii</i> , Trin.....		Willdenow's Wood-grass.
<i>Muhlenbergia diffusa</i> , Schreb.....		Drop-seed. Nimble Will.
<i>Calamagrostis Canadensis</i> , Beauv.....		Blue-joint-grass.
<i>Oryzopsis melanocarpa</i> , Muhl.....		Mountain Rice.
<i>Stipa spartea</i> , Trin.....		Porcupine Grass.
<i>Tricuspis sesleroides</i> , Torr.....		False Red-top.
<i>Dactylis glomerata</i> , L.....		Orchard-grass.
<i>Poa compressa</i> , L.....	Wire-grass.	Pennsylvania Blue-grass.
<i>Poa pratensis</i> , L.....		Blue-grass. June-grass.
<i>Eragrostis poaeoides</i> , Beauv., var. <i>megastachya</i> , Gray.....		Eragrostus.
<i>Festuca elatior</i> , L.....		Taller Fescue.
<i>Festuca elatior</i> , L., var. <i>pratensis</i> , Gray.....		Meadow Fescue.
<i>Triticum repens</i> , L.....	Couch-grass.	Quitch-grass. Quack-grass.
<i>Hordeum jubatum</i> , L.....		Squirrel-tail Grass.
<i>Danthonia spicata</i> , Beauv.....		Wild Oat-grass.
<i>Phalaris arundinacea</i> , L.....		Reed Canary-grass.
<i>Panicum sanguinale</i> , L.....	Common Crab-grass.	Finger-grass.
<i>Panicum latifolium</i> , L.....		Broad-leaved Panicum.
<i>Panicum dichotomum</i> , L.....		Many-branched Panicum.
<i>Panicum crus-galli</i> , L.....	Barnyard-grass.	Cockspur Grass.
<i>Andropogon argenteus</i> , Ell.....		Beard-grass.
<i>Adiantum pedatum</i> , L.....		Maiden-hair Fern.
<i>Asplenium Trichomanes</i> , L.....		Dwarf Spleenwort.
<i>Asplenium thelypteroides</i> , Michx.....		Silvery Spleenwort.
<i>Aspidium cristatum</i> , Swartz.....		Crested Shield-fern.
<i>Aspidium marginale</i> , Swartz.....		Marginal Fern.
<i>Cystopteris fragilis</i> , Bernh.....		Fragile Bladder-fern.
<i>Onoclea sensibilis</i> , L.....		Sensitive Fern.
<i>Ustilago segetum</i> , Pers.....		Bird's-nest Fungus.

REPORT OF CHEMIST.

TESTING BUTTER.

Dr. Thomas Taylor, of the Agricultural Department, Washington, D.C., has issued in the form of an illustrated pamphlet an abstract from the proceedings of the American Association for the advancement of Science, of his method of examining butter and fats by means of the microscope and polarized light. According to this method butter yields peculiar globular crystals, with a characteristic black cross (St. Andrew's) when properly viewed with polarized light. They vary in size, color and other particulars, and are never seen in pure beef or lard fats. Since beef and lard fats are the chief substitutes for and adulterants of butter, any method by which they could be readily distinguished from each other and from butter would be a matter of the greatest importance. Hence Taylor's method, which purports to furnish a ready solution of this difficult problem, has received universal attention. The writer having received a number of samples of the premium butter exhibited at the last fat stock show at Chicago for examination, made a careful study of Taylor's method with a view of adopting it in his investigations in case it was found reliable and could be mastered.

MATERIAL.

1. Pure table butter, made at the University dairy.
2. Common lard, *i.e.*, lard from which none of the olein had been separated.
3. Pure "oleo oil."

This substance is prepared by rendering beef tallow at a temperature of 120° to 124° Fahrenheit, in jacketed caldrons heated by hot water or steam. The "oil" which separates is drawn off and kept at a temperature of about 85° Fahrenheit, until the greater part of the stearin and palmitin crystallizes out. The more readily fusible olein and margarine are obtained by submitting the mass just described to hydraulic pressure. The product thus obtained constitutes the "oleo-oil" employed in adulterating butter, and corresponds almost precisely to the oleomargarine of the French chemist, Mege-Mouries.

4. Olive oil, salt and water.

APPLIANCES.

1. W. H. Bullock's biological stand, polarizing apparatus and No. 1 eyepiece.
2. Bausch and Lomb's three-quarter inch objective, professional series.
3. Glass slides and covers, wooden pill boxes and toothpicks, test-tubes labels, etc

Experiment 1.—Of the butter described above about half an ounce was transferred to a test-tube fused in the flame of a Bunsen burner and gently boiled for one minute. It was then poured into a wooden pill box and allowed to stand until the next day. A small particle of the butter was then taken up on the point of a wooden toothpick and mixed on a glass slide with a drop of olive oil. The particle on being carefully stirred in the oil readily separated into

globular masses visible to the naked eye, and after being covered with an ordinary covering glass and viewed with a pocket lens, presented the appearance of insect eggs, as described by Dr. Taylor. When viewed under the microscope with transmitted light, the magnified globules seemed to consist of a mass of crystalline matter. When viewed with polarized light many of the globules at certain positions of the polarizer revealed a well marked black cross. In some of the globules the cross was fainter and in others distorted, owing no doubt to accidental imperfections in the formation of the globules, or to injuries produced by mounting. When a selenite plate was inserted between the slide and polarizer the sections of the globule produced by the cross were alternately colored red and green.

When these globules are viewed by polarized light, with or without the selenite plate, the appearance which they present is so pronounced, that a person seeing them once would not fail to recognize them again.

Experiment 2.—A portion of ordinary lard was treated in the same manner as the butter in Experiment 1, except that it did not boil, owing to the absence of water. The cooled mass was examined the next day. The particle stirred up on a glass slide with a drop of olive oil separated with difficulty. When covered and viewed with a pocket lens only the most minute specks were visible. No globules as those obtained from butter in Experiment 1 could be seen. When placed under the microscope and viewed with polarized light, nothing but small irregular stellated bodies could be noticed, in which the cross was entirely wanting. A large number of slides were mounted and examined, but not a single "butter crystal" could be found.

Experiment 3 —In order to become acquainted with the behavior of the oleo oil under these conditions a portion of the same was treated as the butter and lard above. On account of its being free from water this substance, like the lard, did not boil on heating. The cooled mass was solid and white like a stearine candle, the yellow color of the oleo having been destroyed by the heating. It separated with difficulty when a small particle was stirred with olive oil on a glass slide. Neither the pocket lens nor the microscope with polarized light revealed any of the globular masses obtained from butter in Experiment 1, although a number of slides were mounted and carefully examined.

Only small stellate crystals were present. Thus far the results and statements of Dr. Taylor were fully corroborated.

Experiment 4.—A mixture consisting of 90 per cent. butter and 10 per cent. oleo oil was boiled and cooled as before. The mounted slides could not be distinguished from the pure butter slides.

Experiment 5.—A mixture was next made of 75 per cent. butter and 25 per cent. oleo oil, and treated as before. Again no difference could be noticed between this adulterated butter and the pure butter. The "butter crystals" were large and perfect, the cross as distinct as in the pure butter, while the slide was remarkably free from any small crystals that might be taken for the adulteration.

Experiment 6 —Equal parts by weight of butter and oleo oil were next mixed together and subjected to the same treatment as above. The results, so far as a most careful examination could reveal, were essentially the same as in Experiment 5.

Assuming that the tallow fat, with which the pure butter was adulterated in the last three experiments, crystallizes out by itself in the form exhibited in Experiment 3, the writer is willing to concede that with only 10 per cent. of adulteration as in experiment 4, the tallow fat crystals might be overlooked. This oversight is much less probable in the next experiment with 25 per cent. of adulteration and is entirely out of the question, when, as in the last experi-

ment, the adulteration amounts to 50 per cent. Hence, it is manifest that the tallow fats united with the butter fats in forming the globular masses.

Experiment 7.—The difference between the behavior of the tallow fats in Experiment 3, and the last three experiments, could only be ascribed to a difference of conditions. It is well known that table butter normally contains 4 to 6 per cent. of salt and 5 to 20 per cent. of water. These ingredients constitute the most marked difference between butter and the rendered animals fats as tallow and lard. In order to test the effect of this admixture upon the tallow fats, about half an ounce of the oleo oil used in Experiment 3 was mixed in a porcelain mortar with a small quantity of salt and eight or ten drops of water. After the water was thoroughly incorporated, the mass was transferred to a test tube and boiled for one minute as in the case of butter. It was then poured into a wooden pill box and allowed to cool as before. The cooled mass presented quite a marked difference in appearance from that obtained from the same substance in Experiment 3. It retained to a great extent the yellow color of the oleo oil, was of a more granular nature, and in fact resembled boiled butter in every respect. When a small particle was stirred up with olive oil on a glass slide it separated readily. When covered and viewed with a pocket lens it revealed a mass of globules resembling insect eggs. Under the microscope these globules exhibited essentially the same characteristics as those obtained from butter in Experiment 1. The crystalline mass of the oleo globules seemed somewhat coarser, and to this condition was ascribed the fact that the cross, as well as the colors produced by the selenite plate, were less sharply defined than in the globules obtained from butter. The slides prepared from this material were remarkably free from the small detached crystals of fat observed in Experiment 3.

Experiment 8.—Having thus discovered that these globular masses may be obtained from pure tallow fat by simply observing the conditions, which obtain in butter making, the following test was made: Nine grams of oleo oil and one gram of lard were placed into a small breaker glass and eight to ten drops of a saturated solution of salt in water added. The mixture was then gently heated to melt the fats. After shaking violently for a few moments to mix the salt solution with the fats, the mixture was boiled gently for one minute and then allowed to cool as before in a wooden pill-box. The microscopic examination of this preparation revealed globular masses, which could in no wise be distinguished from those obtained from pure butter. The crystalline texture was dense, the cross of St. Andrew's plainly marked and the colors produced by the selenite sharply defined.

Experiment 9.—A mixture of one part of lard to five parts oleo oil was treated as in the last experiment with like results.

Experiment 10.—In this test a mixture consisting of 20 per cent. of lard and 80 per cent. oleo oil, was employed. Whether the consistency of this mixture was peculiarly adapted to the formation of the globules or whether possible variations of conditions in manipulation were more favorable, the writer is unable to judge from a single experiment, but the fact is, that in this case individual "butter crystals" were exceedingly large and characteristic.

Experiment 11.—From a mixture of equal parts by weight of oleo oil and lard characteristic "butter crystals" were obtained, the treatment, of course, being the same as in Experiments 8, 9 and 10. The globules, however, were comparatively small and were surrounded with small detached crystals of fat.

Experiment 12.—It is scarcely necessary to say that there must be a limit in the consistency of fatty mixtures, beyond which, either as the melting point rises or falls, the formation of these globular masses at the ordinary temperature of a working-room, is no longer possible. That this consistency, however,

is not restricted to that of butter, nor to very narrow limits may be inferred from Experiments 7, 8, 9, 10 and 11, in which it must have varied by each increased addition of ordinary soft lard. There is also a limit in the consistency of fatty mixtures, beyond which they can no longer be sold for butter. It was, therefore, unnecessary for the object in view to make an experiment in which nothing but the soft lard was employed. This was done, however, with the same treatment as in the last experiments. The microscopic examination failed to reveal any of the characteristic globules. The crystals were small and detached, and these to a great extent dissolved in the warm olive oil after being mounted. The slide thus mounted was placed in a room, the temperature of which fell to about the freezing point during the night. The next morning the slide was white, owing to the solidification of the fats, and consisted of a mass of minute globules visibles with a pocket lens. Under the microscope, with polarized light, the cross of St. Andrew's was very plainly to be seen. Gradually, as the slide became warmer, the globules could be seen, under the microscope, to disintegrate into the crystalline scales of margarine or other fats, which composed them.

This experiment only goes to show that the globular masses obtained above can be produced from the more readily fusible fats, if the temperature is correspondingly lower.

Experiment 13.—A portion of butter was treated again as in Experiment 1, except that the boiling was more violent and continued for two minutes. The globules obtained were much smaller than those of Experiment 1, although they showed the same characteristics as the others. There were also observed a large number of isolated fat crystals.

Experiment 14. Another portion of butter was heated until the boiling ceased. Owing to the discoloration of the casein by the higher temperature, the fat was strained through a piece of flannel into the wooden pill-box. The microscopic examination revealed only a few "small crystals", and these were surrounded or imbedded in a mass of small detached crystals of fat.

Experiment 15.—About half an ounce of newly-churned unsalted butter was heated in a small glass beaker until ebullition ceased. It was then strained through a piece of flannel into a wooden pill-box, and allowed to cool. The microscopic examination revealed a very few widely separated but good specimens of the globular masses, and a larger number of smaller ones, all of which were surrounded by irregular masses of fat crystals.

THEORY OF THE FORMATION OF TAYLOR'S "BUTTER CRYSTALS".

The more solid fats, stearine, palmatin and margarine, crystallize under favorable conditions in elongated pearly scales. The animal fats, as butter, tallow and lard, are, in general terms, mixtures of one or more of these fats with olein, a fat which is liquid at ordinary temperatures. It is a general law in crystallization that when individual crystals begin to appear, they invariably attach themselves to foreign solid bodies of any kind, if present in the crystallizing medium. If the foreign body is a minute speck which remains suspended in the crystallizing medium, crystals will begin to grow out from it simultaneously in all directions, and a globular mass of fine crystals is the result. This is exactly the way in which Dr. Taylor's "butter crystals" are formed. They consist of elongated scales of the solid fat of butter, radiating out in all directions from a central nucleus. The overlapping of these scales produces the effects which these globules present, when viewed with polarized light. The term "crystal," as applied to these globules, is ill chosen, as they are merely agglomerations of individual fat crystals.

From these considerations the action of salt and water in the production of

the globular masses in butter as well as in other fats (Experiments 7 to 12) can readily be explained. The water of the butter coming in contact with salt forms in the course of time a saturated solution. For this reason a saturated solution of salt was employed in Experiment 8, and those following, instead of mixing the fat with salt and water, as in Experiment 7. When butter is boiled in a test tube for a minute, according to the directions of Dr. Taylor, a portion of the water which it normally contains, is evaporated. A corresponding amount of salt is forced to crystallize out. In doing so the crystals of salt produced are so minute that they remain suspended in the liquid fat. They form innumerable nuclei, around which, on cooling, the fat crystals of the butter arrange themselves, producing the globules, which are claimed to be characteristic in butter. This explains the difference of the behavior of the oleo oil with and without the addition of salt and water as well as the production of characteristic "butter crystals" in mixtures of this tallow fat and lard on the addition of a small quantity of a saturated solution of salt water before heating. Of course the writer does not claim that the salt grain is essential to the production of a fat globule of this kind. It may be replaced by a speck of any other solid matter.

CONCLUSION.

Having thus described the production and nature of Dr. Taylor's "butter crystals," and having shown in the experiments given that they are not peculiar to butter, but that mixtures of tallow fat and lard under the conditions which obtain in butter making cannot by this means be distinguished from pure butter, it follows that so much of Dr. Taylor's microscopic investigations as pertains to the formation of characteristic crystals of these various fats is of no practical value in the examination of commercial butter for adulterations. Dr. H. J. Detmers, Professor of Veterinary Surgery of Ohio State University, has made a series of photographs of the prepared slides illustrating the experiments described above. The perfect representation of these globules photographed with polarized light must be regarded as a remarkable achievement in the art of micro photography.

EXPERIMENTS WITH SOIL.

There is no question more often put to the agricultural chemist by farmers who have worn out fields and who wish to increase the yield of their crops by the use of commercial fertilizers, than what ingredient or ingredients are wanting in these fields to produce an average crop.

The question is a legitimate one, since it would be throwing away money to apply any fertilizer deficient in an ingredient of plant food wanting in the soil. At the same time there is, perhaps, no subject on which the chemist is less able to give definite information. A simple analysis of a sample of the soil in question will not suffice, for reasons given in last year's report. (See Report Ohio Agricultural Experiment Station, 1884, page 228).

The testing of the soil should take place on the fields themselves, selecting a number of strips across the fields and applying to these a series of fertilizers of known composition, in the manner described below. The plants themselves are thus brought into requisition to determine the question, which, in most cases, is the only safe method to follow. It is evident that neither the Station nor the Department of Agriculture of the University, as at present constituted, can make these tests for the farmers throughout the State. In order that the Experiment Station may aid and benefit the farmer directly in

this important matter, the writer has devised and in part tested a plan during the past season, which, it is hoped, subsequent experiments may prove feasible:

An excavation was made on the top of a side-hill underlaid with gravel, and thus naturally well drained. Into this excavation nine sewer pipes, two feet in length and fifteen inches in diameter, were placed on end and the earth placed around them to the top of the pipes. They were then filled to within six inches of the top with pure washed sand. The soil of the University farm being all in a high state of cultivation, and unsuitable for this reason, to be employed in the experiments about to be described, a field in the neighborhood was selected, the history of which for the last twenty or thirty years was well known to the writer. The soil of this field was formed in place from Huron shale. It was, therefore, a rather poor soil to begin with but in addition to this fact, it had been farmed during the time mentioned, without the application of manure.

About six hundred pounds of the soil from this field was selected in the following manner: The field was crossed at fixed intervals with a wagon. Every eight or ten paces a square hole was dug with a spade to the sub soil. A slice about two inches thick and of the width of the spade was cut off on one side of the hole from the surface of the soil to the top of the sub soil and thrown into the wagon. Local contaminations were avoided, and any trash on the surface was removed by scraping before the sample was taken. The earth thus collected was thoroughly mixed. Forty pounds were then weighed off and placed into each of the sewer pipes, filling the space between the sand and the top of the pipes completely with soil. In this manner ten miniature plots were obtained, representing as nearly as possible the average of the soil of the field to be tested. On May 2d forty seeds of spring barley were planted in each plot. On May 5th the plots were fertilized as follows:

PLOT No. 1.

Complete Fertilizer.

Sodium nitrate.....	18.3	grams per plot, equals	150	pounds per acre.
Superphosphate	30.5	"	250	"
Magnesium sulphate.....	24.4	"	200	"
Potassium chloride	12.2	"	100	"

PLOT No. 2.

Complete Mineral Fertilizer.

Superphosphate	30.5	grams per plot, equals	250	pounds per acre.
Magnesium sulphate.....	24.4	"	200	"
Potassium chloride	12.2	"	100	"

PLOT No. 3.

Sodium nitrate	18.3	grams per plot, equals	150	pounds per acre.
Magnesium sulphate.....	24.4	"	200	"
Potassium chloride	12.2	"	100	"

PLOT No. 4.

Sodium nitrate	18.3	grams per plot, equals	150	pounds per acre.
Superphosphate	30.5	"	250	"

PLOT No. 5.

Sodium nitrate	18.3	grams per plot, equals	150	pounds per acre.
Potassium chloride	12.2	"	100	"

PLOT No. 6.

Pure Nitrogen Fertilizer.

Sodium nitrate18.3 grams per plot, equals 150 pounds per acre.

PLOT No. 7.

Magnesium sulphate.....24.2 grams per plot, equals 200 pounds per acre.

PLOT No. 8.

No Fertilizer.

PLOT No. 9.

Slaked lime.....183.0 grams per plot, equals 1500 pounds per acre.

Plants made their appearance on May 7. No marked difference could be noticed for the first two weeks. On May 28 the following notes were made:

Nos. 1, 2 and 4 showed a much more vigorous growth than the other plots, which were apparently alike in condition. Nos. 1, 2 and 4 had stooled out. On May 30 the plots were thinned out to the same number of plants in each. When fully ripe the barley was cut, tied in separate bundles and put away to dry. The grain was then separated from the straw by hand and the weight of grain and straw of each plot determined.

The results obtained are as follows, weight expressed in grams:

Plots.	Weight of grain.	Weight of straw.	Plots.	Weight of grain.	Weight of straw.
1.....	52.4	82.4	6.....	30.0	63.6
2.....	41.6	96.6	7.....	32.4	60.0
3.....	22.4	41.0	8.....	25.4	34.4
4.....	41.0	82.0	9.....	24.0	40.4
5.....	26.0	52.4			

In making tests upon a field by fertilizing a series of strips in about the manner followed in the present experiment, in order to determine the essential ingredients of plant food that are wanting in the soil, only marked increases in yield over the plot not fertilized should receive attention. Taking this rule as a guide, the plots employed in this experiment may, at first glance, be divided into two classes, Nos. 1, 2 and 4 forming the one class, and all the remaining plots falling into the other.

Plots 1, 2 and 4 show a marked increase in grain and straw over plot 8, which received no fertilizer. They also showed a much more vigorous growth than the rest. That this growth was not due to the effect of nitrogen may be seen from plot No. 2, which received no nitrogen fertilizer. These three plots have one ingredient in common, viz., superphosphate. Plot No. 4 contains, it is true, a nitrogen fertilizer, but in No. 2 this is wanting, and hence shown to be unnecessary to an increase of crop. This confines the marked increase of yield to the superphosphate. As superphosphate consists of phosphoric acid in combination with lime and mixed with sulphate of lime, and as both lime and phosphoric acid are essential ingredients in plant food, the question still would remain open whether the increase in yield was due to the more expensive phosphoric acid or to the cheaper lime. The question however is settled

by referring to plot No. 9, which had a liberal application of lime, and which showed no increase in yield nor a better growth during the season.

From these considerations the application of phosphoric acid in the form of superphosphate for spring grains, or of fine bone meal for winter wheat or rye is decidedly indicated for this particular field. Furthermore, it would be a useless expense to purchase either potassium, magnesium, or nitrogen, either singly or combined, for the purpose of securing better crops.

The same plots were fertilized last fall in the same manner, and sown to wheat. The only thing that may be said of this experiment at this writing is that the only plots in which the wheat plants had stood out when cold weather set in were plots Nos. 1, 2 and 4.

ANALYSIS OF FEEDING STUFFS.

CORN FODDER OR SIOVER.

In the winter of 1884 to 1885 the writer was called upon to calculate the rations for milk cows of the University dairy. The feed on hand consisted of corn meal, clover hay, corn fodder and sugar beets.

A difficulty was encountered in making up a suitable ration from these substances, since all available analyses of corn fodder represented the whole plant. It is well known by experience that cattle eat only a part of the corn fodder whether it is fed whole or cut. In order to determine what proportion of the fodder was eaten, as well as the composition of the same, a large bundle of good fodder from the center of a rick, built the fall before, was selected for examination. This was divided by hand into two parts, the one consisting of the leaves, sheaths, husks, tassels and one or two of the upper joints; the other of little more than the bare stalks. The weight of each portion was then determined, and the result for 100 parts by weight of fodder are as follows:

Part eaten (leaves, etc.)	58.19
Part not eaten (stalks)	41.81

COMPOSITION OF LEAVES, ETC.

Water	11.30
Ash	7.10
Protein	5.21
Crude fiber	27.44
Nitrogen—free extract	47.34
Fat	1.61
	<hr/>
	100.00

COMPOSITION OF STALKS.

Water	9.00
Ash	4.10
Protein	3.86
Crude fiber	34.29
Nitrogen—free extract	47.26
Fat	1.49
	<hr/>
	100.00

OAT HAY AND OAT STRAW.

During the season of 1884 a field of oats on the University farm was partly cut and cured for hay when the seed was in the milk, while the remainder was allowed to ripen. Average portions of the hay and straw were collected for analysis, it being the intention to use both the hay and straw in feeding the dairy stock.

The following analyses give the composition of the hay and straw in 100 parts:

OAT HAY.

Water	8.70
Ash	7.45
Protein	7.75
Crude fiber	25.10
Nitrogen—free extract	47.95
Fat	3.05

100.00

OAT STRAW.

Water	8.15
Ash	6.65
Protein	4.00
Crude fiber	45.09
Nitrogen—free extract	33.54
Fat	2.57

100.00

LINSEED MEAL—OLD PROCESS.

Water	8.07
Ash	6.00
Protein	32.20
Crude fiber	9.73
Nitrogen—free extract	37.97
Fat	6.03

100.00

LINSEED MEAL—NEW PROCESS.

Water	12.25
Ash	5.30
Protein	34.19
Crude fiber	9.28
Nitrogen—free extract	35.48
Fat	3.50

100.00

The sample of Old Process Meal was obtained from Chas. Boch, Colerain avenue, Cincinnati, Ohio. The sample of New Process Meal from Cincinnati Linseed Meal Co., No. 9, West Fourth street, Cincinnati, Ohio.

ANALYSIS OF CHEESE.

Two samples of cheese were sent for examination from Wellington, Ohio, by Mr. B. B. Herrick, the one being a full milk cheese manufactured by B. B. Herrick, Wellington, Ohio, and the other what is known as "Chicago Flats." As the latter is alleged to be brought into market and sold as Ohio cheese, an analysis of the two samples was made in order to give the consumer an idea of their relative merits.

B. B. HERRICK'S FULL MILK CHEESE.

Water	35.42
Ash	2.47
Fat	31.66
Albuminoids and non-nitrogenous matter, not fat	30.45

100.00

CHICAGO FLATS.	
Water	52.73
Ash	2.69
Fat	2.68
Albuminoids and non-nitrogenous matter, not fat.....	41.90
	<hr/> 100.00

EXAMINATION OF DRINKING WATER.

The following potable waters have been examined for organic matter. The numbers represent the parts of organic matter in 1,000,000 parts of water:

1, Well, Newark, Ohio	12.5
2, " "	9.5
3, " New London, Butler county	1.4
4, " " "	4.7
5, " " "	16.7
6, " Paddy's Run, "	5.6
7, " " "	19.6
8, " " "	1.4
9, " Wauseon, Fulton county	100.9
10, " 39 King avenue, Columbus, Ohio	24.8
11, " 35 " "	13.9
12, Spring, Kiriland, Trumbull county	37.6
13, Well, " "	57.1
14, " University	10.2
15, " West Woodruff avenue, Columbus, Ohio.....	40.0
16, " Farm house, University	10.4

ANALYSIS OF SORGHUM CANE.

Of the juice of Early Amber cane grown by the Experiment Station an analysis was made when the seed had reached the hardening dough stage. The results are as follows:

Specific gravity, at 20 degrees C.....	10 B.
Cane sugar	11.50 per cent.
Grape sugar	3.72 "

MUCK.

A sample of muck was sent by D. G. Heacock, Atwater, Ohio, with a request to determine whether it contained ammonia, phosphoric acid and potash. An examination revealed ammonia, phosphoric acid, lime and magnesia in abundance. The potash was present in less proportion.

SOIL AND SUBSOIL.

Mr. Geo. Collins, Millbury, Wood county, Ohio, sent a box containing a portion of soil and its subsoil for examination. The soil was black, rich in humus and the subsoil was clay. Mr. Collins stated in his letter that the soil failed to produce good crops and that barnyard manure and wood ashes seemed of no benefit. On examination the soil was found to be rich in ammonia, phosphoric acid, lime and magnesia, as well as ferric oxide. Hence, there seemed to be no lack of plant food. The only difficulty suggested itself was probably an undue amount of ferrous salts. The remedies suggested were thorough drainage, fall plowing and an avoidance of plowing too deep at once.

FERTILIZER.

L. Reeve, Colebrook, Ashtabula county, Ohio, sent for analysis a specimen of a fertilizer taken from a large deposit, which, it was supposed, might contain an admixture of pigeon guano. It contained—

Phosphoric acid.....	0.27 per cent.
Nitrogen.....	0.35 “

Estimating the phosphoric acid at 8 cents per pound and the nitrogen at 20 cents per pound, the money value of this material, leaving out of consideration the ameliorating influence it would have on a heavy soil on account of the large amount of humus present, would be \$1.83 per ton.

MANURE.

A sample of manure, taken from a pile 40x70x2½ feet deep, and kept under cover, was sent by John E. Bruce, Eaton, Ohio, with a request to learn its composition and money value. As the manure was treated in a rational manner and was obtained from well fed stock, the following analysis of such a manure was sent:

Nitrogen.....	0.50 per cent.
Phosphoric acid.....	0.26 “
Potash.....	0.63 “
Soda.....	0.19 “
Lime.....	0.70 “
Magnesia.....	0.18 “
Sulphuric acid.....	0.16 “
Silica.....	1.68 “
Chlorine.....	0.19 “

From this analysis the money value of the manure was calculated and found to be \$3.04 per ton.

BONE MEAL.

A sample of material sent by A. J. Shaffer, Jreeburg, Ohio, taken from a sack of fertilizer, was found to be ground bone.

METEOROLOGICAL REPORT.

W. B. ALWOOD.

A brief summary of the important meteorological conditions which prevailed during the year ending October 31, 1885, is here given:

An extended discussion of the subject is unnecessary, from the fact that the excellent reports of the Meteorological Bureau, issued regularly each month, cover the entire subject and are to be obtained by addressing the secretary, at Columbus.

Table I. gives a general summary of the meteorological conditions prevailing over the entire State. Table II. relates distinctly to the conditions prevailing at this Station, and Table III. compares the other two as to temperature and rainfall and also compares them with the normal mean for the State.

This latter is made up from a series of observations covering a long period of years.

The year shows quite a deficiency in average temperature, being nearly 3° below the normal for the State and 2.5° below the average of the previous year.

The normal rainfall for the State is 40.41 inches. Here also is an average deficiency for the State, amounting to about two inches, though the record for this station shows an excess of nearly two inches.

By reference to Table III. it will be seen that the rainfall for this station is above the normal for every month from April to September, except July. The precipitation, however, was so distributed through the month that it did not seriously interfere with farming operations. It will also be seen from this table that there was a deficiency in average temperature for every month of the year, except July and October, and in the latter month there is a deficiency at this station. This deficiency is especially marked during January and February.

The extremes of temperature for the State vary but little from the previous year, both years being marked by the great severity of their winters. The maximum, 101° , which was recorded at the Station the past year, has not been reached for some years in this State; the minimum, 34.4° below zero, is but .4 below the previous year. While the winter, as a whole, was not more severe than the previous, yet the conditions were such that wheat was badly injured, being not half a crop. So far as our observation extended, this was not caused so much by freezing or heaving out, as by being actually frozen to death in the soil.

Excepting wheat, the harvests were more than usually abundant.

The past year is the first for a series of years that has not been marked by a severe drouth visiting some portion, and many times a considerable part of the State has suffered.

The abundance of moisture, especially during August, doubtless aided the ravages of the potato rot, which inflicted severe loss on some localities. The slight precipitation of March is phenomenal.

TABLE I.—STATE SUMMARY FOR THE YEAR BEGINNING NOVEMBER 1, 1884, AND ENDING OCTOBER 31, 1885.

Month.	Mean temperature.	Highest temperature.	Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Total rainfall for month.	Average daily rainfall.	Prevailing direction of wind.
November.....	39.4	78.0	1st.	47	24th.	73.3	20.0	48.0	10th.	1.5	29th.	1.39	.046	W.
December.....	30.2	69.0	4th.	-32.4	19 h.	91.0	17.3	50.0	4 h.	1.5	8th.	3.69	.119	W.
January.....	22.6	76.0	9 h.	-31.0	29th	107.0	18.1	58.5	30 h.	1.2	7 h.	4.16	.134	W.
February.....	19.3	62.3	28th.	-27.0	13 h.	86.6	22.1	58.0	10 h.	4.0	*1	1.85	.066	W.
March.....	29.1	76.0	31st.	-9.8	21st.	85.8	19.4	46.0	*2	3.0	5th.	.81	.026	W.
April.....	48.5	92.0	231.	11.5	4th.	80.5	21.6	50.0	2d.	1.0	18th.	3.17	.106	W.
May.....	59.5	91.0	5 h.	21.0	3d.	70.0	23.0	50.5	15th.	3.0	9 h.	3.97	.128	W.
June.....	67.1	96.0	7th.	36.0	23d.	60.0	22.8	46.0	11 h.	8.0	5th.	4.34	.145	W.
July.....	75.2	101.0	21st.	40.0	23d.	61.0	24.2	43.0	4 h.	6.1	22d.	3.20	.103	W.
August.....	68.9	98.0	1st.	40.0	27th.	58.0	20.2	42.0	21st.	4.3	10th.	6.33	.204	N. E.
September.....	62.9	95.0	19th.	28.0	2 t.	67.0	22.0	46.0	25th.	3.0	10th.	2.49	.083	W.
October.....	62.9	83.0	18th.	14.0	31st.	69.0	20.4	45.0	*3	4.5	6th.	3.30	.106	W.

Only thermometers which have been compared with the standard have been used in making up the averages.
^{*1}—16th and 26th. ^{*2}—4th and 16th. ^{*3}—10th and 18th.

Mean temperature.....	48.8 degrees.	Number of clear days.....	108.9
Highest ".....	101.0 "	" fair ".....	131.5
Lowest ".....	-34.4 "	" cloudy ".....	124.5
Range of ".....	135.4 "	" days on which rain fell.....	145.4
Mean daily range of temperature.....	20.9 "	Total rainfall for year.....	38.7 inches.
Greatest ".....	58.5 "	Average daily rainfall.....	.105 "
Least ".....	1.0 "	Prevailing wind.....	S. W.

TABLE III.—MEAN TEMPERATURE AND RAINFALL FOR THE YEAR ENDING OCTOBER 31, 1885.

	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.
	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degs.</i>
Mean temperature for the State	39.4	30.2	22.6	19.3	29.1	48.5	49.5	67.1	75.2	68.9	62.9	62.9
Mean temperature for this station	37.9	28.8	21.1	17.8	29.4	49.0	59.3	65.8	75.2	69.5	62.8	48.6
Normal mean for State.....	41.6	32.0	28.9	32.3	38.2	50.5	60.7	70.4	74.5	72.2	65.4	52.3
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Ins.</i>
Mean rainfall for state	1.39	3.59	4.16	1.86	0.81	3.17	3.97	4.34	3.20	6.33	2.49	3.30
Rainfall for this station	1.13	3.87	4.03	3.17	0.98	4.51	5.92	4.81	3.01	5.50	2.00	3.12
Normal mean for state	3.26	3.24	2.65	2.51	3.37	3.49	3.85	4.02	3.90	3.76	3.63	2.73
Mean temperature of the State	48.8 degrees.											Total rainfall for the State.....
Mean temperature of this station	47.1 degrees.											Total rainfall for this station.....
Normal mean temperature of State	51.6 degrees.											Normal rainfall for State
												38.70 inches.
												42.08 inches.
												40.41 inches.

REPORT ON FORESTRY.

The following is a list of the principal timber trees of Ohio. Few States can boast of a larger number of valuable varieties :

Cucumber Tree	<i>Magnolia acuminata.</i>
Tulip Tree. Yellow Poplar. White Wood	<i>Liriodendron tulipifera.</i>
Basswood. Linden.....	<i>Tilia Americana.</i>
Ohio Buckeye.....	<i>Æsculus glabra.</i>
White or Silver Maple	<i>Acer dasycarpum.</i>
Red or Soft Maple	<i>Acer rubrum.</i>
Sugar or Rock Maple.....	<i>Acer saccharinum.</i>
Ash-leaved Maple. Box Elder	<i>Negundo aceroides.</i>
Black or Yellow Locust	<i>Robinia Pseudacacia.</i>
Kentucky Coffee Tree.....	<i>Gymnocladus Canadensis.</i>
Honey Locust.....	<i>Gleditsia triacanthos.</i>
Wild Black Cherry	<i>Prunus serotina.</i>
Tupelo. Pepperidge. Sour Gum.....	<i>Nyssa multiflora.</i>
White Ash.....	<i>Fraxinus Americana.</i>
Green Ash	<i>Fraxinus viridis.</i>
Black or Swamp Ash	<i>Fraxinus sambucifolia.</i>
Blue Ash	<i>Fraxinus quadrangulata.</i>
White Elm.....	<i>Ulmus Americana.</i>
Red Elm. Slippery Elm	<i>Ulmus fulva.</i>
Hackberry. Sugar Berry.....	<i>Celtis occidentalis.</i>
Common Mulberry	<i>Morus rubra.</i>
Buttonwood. Plane. Sycamore	<i>Platanus occidentalis.</i>
Butternut.....	<i>Juglans cinerea.</i>
Black Walnut.....	<i>Juglans nigra.</i>
Shell-bark Hickory	<i>Carya alba.</i>
Large Shell-bark	<i>Carya sulcata.</i>
Small Fruited Hickory.....	<i>Carya microcarpa.</i>
White-heart Hi kory.....	<i>Carya tomentosa.</i>
Pignut Hickory.....	<i>Carya p. rcina.</i>
Butternut Hickory	<i>Carya amara.</i>
White Oak	<i>Quercus alba.</i>
Post Oak	<i>Quercus obtusiloba.</i>
Bur Oak	<i>Quercus macrocarpa.</i>
Swamp White Oak	<i>Quercus bicolor.</i>
Yellow Oak.....	<i>Quercus castanea.</i>
Red Oak	<i>Quercus rubra.</i>
Scarlet Oak	<i>Quercus coccinea.</i>
Black Oak	<i>Quercus tinctoria.</i>
American Chestnut	<i>Castanea vesca.</i>
Beech	<i>Fagus ferruginea.</i>
Sweet or Black Birch	<i>Betula lenta.</i>
Yellow Birch.....	<i>Betula lutea.</i>
Paper or Canoe Birch.....	<i>Betula papyracea.</i>
Red or River Birch	<i>Betula nigra.</i>
White Willow	<i>Salix alba.</i>
Cottonwood.....	<i>Populus nonifera.</i>
Pitch Pine	<i>Pinus rigida.</i>
White Pine.....	<i>Pinus strobus.</i>
Hemlock	<i>Tsuga Canadensis.</i>
Red Cedar.....	<i>Juniperus Virginiana.</i>
American Larch	<i>Larix Americana.</i>

The above list contains more than fifty varieties of valuable timber trees. In addition, there is found growing within the borders of the State many imported varieties, some of which are being extensively planted. The Station has not tested these sufficiently to feel warranted in recommending them to tree growers in preference to our best native species.

COMPARATIVE GROWTH AND HARDINESS OF FOREST TREE SEEDLINGS.

The following table presents a brief synopsis of the results of some experiments in forest tree culture :

Variety.	When planted.	Age when transplanted.	Per cent. killed by severe winter.	Size at end of season, 1885.	
				Height.	Circumference.
				ft. in.	in.
Red Oak.....	1883	Seedling	20.4	4 0	3 $\frac{1}{2}$
Chestnut	"	"	55.5	3 7	3 $\frac{1}{2}$
White ash.....	"	"	5.7	5 8	4
Catalpa	"	"	8.2	7 3	9 $\frac{1}{2}$
Beech.....	"	"	38.8	1 5	1 $\frac{1}{2}$
Black ash.....	"	"	1.0	4 0	4 $\frac{1}{2}$
Wild cherry.....	"	"	6.1	9 3	5 $\frac{1}{2}$
Scarlet maple.....	"	"	1.2	3 4	3 $\frac{1}{2}$
Green ash	"	"	0.0	6 4	5
Sugar maple.....	"	"	6.9	3 3	2 $\frac{5}{8}$
White oak.....	"	"	81.1	2 2	2 $\frac{3}{8}$
Black walnut	"	2 years...	50.9	4 0	3 $\frac{3}{8}$
Red oak.....	"	Seedling	5.2	3 6	2 $\frac{7}{8}$
Yellow locust.....	"	2 years...	0 0	14 0	7 $\frac{1}{2}$
Cucumber	"	Seedling	33.3	2 2	2
Ky. Coffee tree	"	"	4.0	2 4	2 $\frac{3}{4}$

Lack of space forbids the publication of any further notes on the subject of forest-tree culture, or the Station's tests with hedge plants and evergreens.

SAMPLES OF STATION CORRESPONDENCE.

The following samples will serve to illustrate the character of the correspondence of the Station during the past year. An average of more than six letters of similar nature were received each day. These letters of inquiry are in addition to the regular business correspondence of the Station, which is very large:

GOLDEN CORNERS, WAYNE COUNTY, O., *Jan. 6, 1885.*

William R. Lazenby:

DEAR SIR: Have you had any experience with millet? If so, will you please tell me how many pounds it takes to sow an acre, and which is the best variety for clay land.

Is the Experiment Station ready to analyze soil, and what is the cost of having it done?

Yours truly,

T. A. ARMSTRONG.

ANSWER.

We have tested several varieties of millet, and find the "Golden" the best. While it makes good hay, think, on the whole, that the millet family is better for green feeding. From 16 to 20 quarts of seed should be sown per acre. It does better on loamy land, but will produce a good crop on any good soil. The ground must be well fitted in order to secure a good stand.

The Station can analyze soils, but this rarely pays, unless there is some marked peculiarity. We will carefully examine a sample of your soil, if you choose to send it; and if, in your judgement, an analysis will be of any value, it will be made free of charge. Send six to eight pounds of soil—taking pains to get a fair average sample—in a small box by express.

CENTER VILLAGE, DELAWARE COUNTY, O., *Jan. 31, 1885.*

Professor Lazenby, Columbus, Ohio:

DEAR SIR: I was informed the other day that you would answer questions in regard to farming. I would be glad to have your opinion on one point. I have 17 head of two year old steers tied in stanchions; am feeding hay only. Now, will it pay me to feed these steers corn, or will it pay better to feed the corn to hogs next summer? The steers are doing very well; they have a warm room, and a good straw bed. I do not let them out only to haul the manure once in about 14 days.

Please answer, and very much oblige,

M. B. C. RICH.

ANSWER.

At present prices of beef and corn, it will most assuredly pay to feed two-year old steers corn. I should do so, if I had to buy every bushel. Whether you will make more by feeding hogs next summer, I am not prepared to say. This will depend upon the age of the pigs, price of corn and pork at that

time, etc. But as far as my experience and observation go, you will make no mistake feeding the steers.

If you can grind the corn, this will pay; will unless you have pigs enough to eat all that passes undigested. If you have convenience for weighing, I would advise you to test the matter for yourself. You could do it in this way: Take, say five, of your steers and weigh them together, then weigh at the same time another lot of five that seem to be in about the same condition. Feed both lots the same amount of hay, and feed one lot a bushel of corn per day in addition. If you intend to keep your steers over another year, I should not recommend heavy feeding of corn; but I believe a few ears given each steer every day will bring you a handsome return.

DAYTON, OHIO, *January 8, 1885.*

Prof. Lazenby:

Enclosed with this you will find a heliotrope plant with several singular root appendages that I yesterday exhibited at the meeting of the Montgomery County Horticultural Society. No person there being capable of giving any explanation of its formation, I was requested to forward it to you for such light as you could cast on the subject, as you will see by the accompanying printed slip.

I have seen similar formations before on the roots of geraniums, sissus vines and perhaps other plants.

My view is that each whorl of appendages along this central axis is a growing point, a long or underground stem, that under favorable conditions might produce a plant.

I have now two specimens taken from this plant when they were fresh, that under favorable circumstances of warmth and moisture, seem to be growing.

Please give the matter such attention as you deem the subject worth and report to me, and I will take pleasure to lay the matter before our society at its next meeting, the first Wednesday in February.

Respectfully,

D. McCARTHY.

ANSWER.

I regret to have kept you waiting so long for the answer to your inquiry of January 8.

The peculiar development shown by the specimen received is not a modified root, as I at first supposed, but simply a branch that has grown under ground. The appendages along these branches are simply reduced or modified leaves, which have become greatly thickened and distended with a deposit of starch. The internodes of the branch have not elongated, hence the leaves are small and crowded together.

I was assisted to this conclusion by the well known specialist, Prof. J. C. Arthur, of Geneva, N. Y. Your own view of this peculiar development was approximately correct.

I should be most happy to receive further illustrations of this freak.

ONTARIO AGRICULTURAL COLLEGE,
GUELPH, *February 3, 1885.*

DEAR SIR: I have heard that you have an interesting apparatus for testing the vitality of seeds. You would confer a great favor if you would send me a

report regarding tests with it, and also where I could secure such apparatus for our own use.

Yours respectfully,

J. HOYLES PANTON,

Prof. Nat. Hist. Agl. College, Guelph.

PROF. LAZENBY, *Ohio Exp. Station.*

ANSWER.

I mail you our first and second Reports, from which you can learn what we are doing in the way of seed testing. In our first Report, page 114, is given a brief description of the seed-tester used at the Station, which, with the aid of the rude drawings enclosed, you will readily understand how to construct. This apparatus gives much better satisfaction than anything else I have ever seen.

I think there is no place where they are made and I know of but one other place where they are used. The one for the Station was made in Columbus by a tinsmith and the enclosing box by a carpenter, under our direct supervision, the whole costing about \$15.00, including a small oil stove for heating. We find, however, that a good lamp with a burner made to use without a chimney will give a high enough temperature for most seeds and is more easily regulated.

If there is anything that you do not fully understand about the description or drawing I will be glad to explain.

Do you publish a report of the operations at the college? If so, will you please mail copies to the officers of the Station, as given in the upper right hand corner of this sheet, and a copy to the Experiment Station library?

GREENTOWN, O., Feb. 19, 1885.

Professor Lazenby:

DEAR SIR: Allow me to ask you why it is that wheat after barley is so much better than after oats, soil being the same in every particular? Oats and barley sown in the same field, and then followed with wheat can be noticed almost as far as you can see the field.

An early reply will greatly oblige.

Respectfully yours,

W. G. JOHNSTON.

ANSWER.

Yours of the 19th is just at hand. The only reasonable explanation of the question you ask is this: Oats occupy the land for a longer period, and, as a rule, yield a much heavier crop in total weight of straw and grain. It is also claimed by some that the oat roots, being larger and growing deeper, leave light soils in a poorer condition mechanically than does barley. Whatever the explanation, the fact observed by you holds true in nearly all sections of the country where these three grain crops are grown.

You may like to know what the difference in chemical composition is between the oat and barley, so I append averages of a large number of analyses:

	Per cent. of ash.	Potash.	Lime.	Phosphoric acid.
Barley—grain, 34 analyses, . . .	2.5	21.9	2.5	32.8
Oats—grain, 20 analyses, . . .	3.0	15.9	3.8	20.7
Barley—straw, 17 analyses, . .	5.1	21.6	7.6	4.3
Oat—straw, 6 analyses,	5.1	22.0	8.2	4.2

You see from the table that, weight for weight, the comparative power of these two crops to exhaust the soil is not explained by any difference in chemical composition. The cause first assigned is undoubtedly the main one.

WAUSEON, O., May 4, 1885.

DEAR SIR: I send you to-day a plant, the name of which I desire. It grows in moist and wet ground in the woods, and is generally our first plant to blossom in the spring. I have never heard any name for it, and as I am not much of a botanist, I cannot identify it.

I am, very respectfully,

THOS. MIKESELL.

ANSWER.

The plant you sent for name is a species of Bitter cress (*Cardamine rhomboidalis*, var. *purpurea*, Torr.), one of our spring flowers, belonging to the natural order *Cruciferae* or Mustard family. Usually found in wet woods, but occasionally intrudes upon damp meadows.

We will take pleasure in identifying all plants you may send us for that purpose.

To a valued correspondent who does not care to have his letters or name published, the Station made at one date, the following reply:

ANSWER.

It is not an easy matter to give the grounds upon which we base an opinion concerning any particular seedsman, yet it is scarcely possibly to have dealings with different firms and still not have an opinion concerning each. A good opinion may often come from some personal favor, and a bad opinion may come from some fancied or real slight.

In order to be as fair as possible, I will give you a few facts concerning each firm, which will enable you to see whether the opinion is just:

Peter Hendersok & Co., have a high reputation, and we have found them reliable. A few facts, however, tell against them. They frequently send out varieties with their name attached that are really the same as other seedsmen sell under other names. Henderson's First of All Peas they claim to be the earliest known, but we find it no earlier, but identical with Phil. Extra Early. Their Premier cabbage is a fair strain of Early Etampes. They puff these things highly, and sell for high prices, but their goods, with few exceptions, are not superior to those of other seedsmen.

D. Lindreth & Sons are reliable, but they have some failings. A prominent one is the habit of renaming old things. They have done more to confuse vegetable nomenclature than any other firm. It is almost impossible to select from their catalogue any desired variety that you may have obtained from another source, simply because it is given another name, or perhaps some little variation is given the name, so as to make it unrecognizable. Their seeds, however, are always fresh and good, with perhaps a few exceptions. Many varieties of their cabbage are not so carefully selected as they might be, but in general, their seeds are very pure and never fail to germinate.

James Vick has as good seeds as can be obtained anywhere. He cuts down the list of varieties by excluding those that are known to be worthless, and know from personal observation that he tests everything carefully before sending out. Vick buys much of his seed, but is very careful to buy only of reliable growers, and generally does not buy until he tests the seed.

D. M. Ferry & Co. have always sent us good seeds, but some of their commission seed obtained at groceries was of a very low vitality. They handle different grades of seeds, but if one is sure that he is getting their best grade he may be satisfied, for he could do no better, but he certainly could do no worse than to get their second grade. They are large growers and large buyers, and it is scarcely possible that everything they handle should be the best to be found.

J. J. H. Gregory is a practical man and knows his business. His seeds are usually good, but he is disposed to charge pretty high for his good name. He has also a trick of entrapping the unwary with a long list of novelties, and sometimes he forgets to mention the failings of his pets, even when he must have plenty of time to discover them. As an instance, his Gen. Garfield Tomato was worse than worthless, although sold at a high price, but after the first season he had nothing to say about it. He usually lets his pets die a natural death and gives them no funeral. A person must know just what he wants if he buys of Gregory, otherwise he may pay a big price for some worthless novelty. If he knows what he wants Gregory can supply it, and of good quality.

W. Atlee Burpee may have good seeds for sale, but some of his seeds tried this season are very badly mixed.

Isaac Tillinghast makes a speciality of Puget Sound grown cabbage seed, and claims it to be the best in the world, but our trials do not show it to be such, nor as good as some others.

A. W. Livingston's Sons, of this city, take the lead on tomatoes, but they buy most of their other seed.

There are others with whom we have had dealings, but this letter is already quite long. If you have any questions to ask concerning any particular firm, I shall be glad to answer, if I can.

MECHANICSBURG, CHAMPAIGN CO., O.

Will you please to give me at your earliest convenience the value of corn cobs as a fertilizer.

J. J. WARE.

ANSWER.

Your inquiry in regard to the value of corn cobs as a fertilizer is at hand. The value of the cobs depends very much upon the nature of the soil upon which they are to be used. For a heavy clay soil they would undoubtedly prove very serviceable, as they would have an excellent mechanical effect. Upon light soils, sandy loams or muck, it is not likely that their application would be very profitable.

The analysis of corn cobs is as follows :

Water	10.0 parts.
Organic matter.	83.0 "
Ash	2.8 "
Albumenoids	1.5 "
Carbohydrates	44.0 "
Crude fiber	38.0 "
Fat, etc.	1.5 "

This is the approximate composition of the whole cob. The chief value of the cob as a fertilizer lies in the ash. The analysis of the ash is as follows:

Potash.	47.0 parts.
Silica	26.5 "
Phosphoric acid.	4.5 "
Lime	3.5 "
Magnesia	4.0 "
Together with a small per cent. of soda, sulphuric acid, and traces of other elements.	

You will notice that the percentage of potash is quite high, while that of phosphoric acid and lime is comparative low. I have seen corn cobs used with excellent results upon stiff clay soil, but whether that effect was due to the elements of plant food contained within themselves or was strictly due to mechanical effect that the cobs had upon the soil, I am unable to say.

If you can obtain cobs cheaply and can apply them to heavy soil without much expense, I should certainly advise you to test the matter thoroughly, and I should be pleased also to know the results.

AKRON, OHIO, *March 21, 1885.*

DEAR SIR: In answer to your card of the 25th, ult., I will say plum tree culture I understand quite well. In plum raising I am not so successful, and on this point I need a few "pointers."

Respectfully and truly yours,

M. HARTER.

ANSWER.

Your trouble is doubtless due to the curculio, which stings the plums before they are mature. If such is the fact, the best plan is to jar the trees and catch the insect on sheets spread underneath the branches on the ground. This should be done every morning, quite early, from the time the trees are in bloom until the stones of the plums harden, which is usually three or four weeks. Prepare a sheet large enough to reach as far as the branches extend. Spread this on the ground around the tree, then jar the tree by giving several sharp blows with a long handled mallet on a spike driven into the body of the tree or upon the stub of a limb cut off for the purpose. The curculios will fall upon the sheet, and can be easily gathered and burned, as they "play possum" when frightened. This plan does not take very much work when you are once prepared for it, and it will usually be found to be quite profitable.

If this does not meet your wants let us know.

MELROSE, PAULDING COUNTY, OHIO, *August 15, 1885.*

DEAR SIR: What is your advice in regard to winter protection for strawberries? Shall I cover them with straw? If so, what kind? How thick should the straw be put on? Should I use wheat or oats straw? I have been recommended to sow oats to protect them. I would like your advice. I have 1,000 plants, set spring of 1885—varieties, Wilson and Sharpless.

Respectfully yours,

J. W. TURNER.

ANSWER.

Swamp hay is the best material to cover strawberry plants. If it cannot be obtained, you can use any convenient material that does not pack too closely together, so as to smother the plants. Wheat or oat straw is very good, if free from weed seed. If the straw contains wheat or oats they are not so bad as timothy, clover or weed seed. Leaves are good, but blow off easily. It is a good plan to put forest leaves on thickly between the rows and then to cover the whole surface with straw. Do not put leaves directly over the plants. You may put straw on as thickly as you please between the rows, the more the better; but the plants should be covered merely enough to hide them from sight. One or two inches is enough. Cover in December or as soon as the ground freezes. In the spring part the straw over the rows, so as to allow the plants to come through.

There is difference of opinion as to the practice of sowing oats. If the oats are quite thick and make a good growth they will afford considerable protection, but to grow them takes from the soil food required by the plants. If the plants have made a good growth early in the season and the soil is rich, the plan may be a good one, otherwise, not. The better plan usually is to keep the patch clean so as to secure a good growth of plants and then to cover with some good material.

Mr. Will Housel, Canton, O., wrote a long letter, asking for information on the general subject of fruit culture.

ANSWER.

Almost any soil that is moderately rich and well drained is suited to the fruits named. Up-land is usually better than bottom land for fruit trees, but whether the soil is sandy or clayey does not matter greatly. A well drained clay loam is usually preferred, however. Drainage is important, as no kind of fruit tree will do well where water stands for any length of time. Soil that will grow good farm crops is rich enough.

Authorities might differ as to varieties, and much depends upon your purpose in planting, whether for market or for family use. Presuming the latter to be your purpose, the following list will probably meet your requirements. The varieties are named in the order of ripening, not in the order of excellence:

Plums.—Yellow Gage, Washington, Green Gage, Lombard.

Cherries.—May Duke, Early Richmond, Gov. Wood, Black Tartarian.

Pears.—Dearborn's Seedling, Bartlett, Louise Bonne de Jersey, Duchess de Angouleme, Sheldon, Lawrence, Beurre Eas. Bartlett does not do well as a dwarf. Standard trees will probably give you better satisfaction than dwarfs.

Peaches.—Alexander, Early York, Crawford's Early, Old Mixon Free, Stump the World.

Grapes.—Worden (black), Brighton (red), Lady (white), Concord.

Currants.—Red Dutch, White Dutch, Cherry.

Gooseberries.—Houghton, Downing, Smith's Improved.

Blackberries.—Snyder, Taylor (the only hardy kinds).

Raspberries.—Doolittle (black), Ohio (black), Gregg (black), Turner (red), Cuthbert (red). Black and red ripen at the same time.

There are many other good varieties than those named, but these are among the best.

The nursery firm named is a good one. So are Elwanger & Barry, of Rochester, N. Y., and Storrs, Harrison & Co., of Painesville, O. You can,

however, do just as well to buy of some smaller nursery nearer home. B. F. Berlin, of Louisville, Stark county, G. W. Dean, of Kent, Portage county, and J. L. Green, of Granger, Medina county, could doubtless give you as good satisfaction as to quality and prices as you could get anywhere. Do not, under any considerations, patronize an agent, unless you are personally acquainted with him and feel sure of his honesty. Any of the firms named will sell you trees for about half the price an agent can, and the trees will be true to name.

STRONG VILLE, O., July 9, 1885.

W. S. Devel:

DEAR SIR: * * I enclose specimen of what some of our farmers call Buffalo grass, others Poverty grass. I think it only takes the place of grass where it dies out through poverty of soil. I send you specimens 1, 2, 3, 4.

No. 1—Buffalo or Poverty grass, found only in poor pastures or meadows. No. 2—A hardy early grass called here Rye grass. No. 3—A grass found in shady or moist places. No. 4—Comparatively new here; an Englishman tells me it was called "Lamb's foot" in England and sowed there, and prized because it started so quickly after cutting. A down-east Yankee says, "we used to find it a nuisance in Southern clover seed, and we called it Southern Plantain."

Respectfully yours,

W. E. GALLUP.

ANSWER.

Plants received, and names below:

No. 1—*Daxthonia spicata*, Beauv., Wild Oat Grass.

No. 2—*Panicum dichotomum*, L., Panic Grass.

No. 3—*Festuca elatior*, L., Tall Fescue. Meadow Fescue.

No. 4—*Plantago lanceolata*, L., Ribgrass. Narrow-leaved Plantain. Buck Plantain.

Nos. 1 and 2 are wild grasses, of no value, sometimes a little troublesome in pastures, and No. 2 in cultivated ground. The names you give are not used in speaking of these species, and No. 2 should never be called Rye grass, for there is a genus designated by that name—the *Loliums*. No. 3 is quite a valuable pasture and meadow grass, worthy of extended cultivation in moist situations. No. 4 is quite a bad weed wherever established. It has been sowed in this country for sheep pasture, much to the discomfort of the experimenter. It is not valuable for pasture, and should be destroyed wherever found.

SHORT CREEK, O., Feb. 16, 1885.

Mr. W. R. Lazenby:

DEAR SIR: Thousands of bushels of corn have been brought to this county from the West, mostly from Indiana, and sold to farmers for feeding stock this present winter, and it now appears that much will yet be required. We find there is a prejudice against Western corn. Some claim it is not so good, that it will require more of it to accomplish the same result than of the home grown. Some men carry this notion so far as to pay 8 to 10 cents per bushel for the home grown ear corn in preference to the Western article shelled. Now, I believe that these men are prejudiced; and that, pound for pound, there is no difference to speak of in the real nutritive ingredients, but I can't prove it.

My object in writing to you is to ascertain if the Experiment Station, either

by analysis or by experiments in feeding, or both, can give us the actual facts in the matter. That there should be any special difference in sound corn, simply because one sample was grown in Indiana, and one is Eastern Ohio, is more than I can comprehend.

I would be pleased to have your opinion on the subject.

Yours truly,

HIRAM COPE.

ANSWER.

I answer to your inquiry of the 16th inst. I would say that corn, well grown, properly matured, and carefully preserved, what we call good sound corn, does not show a very marked variation in chemical composition.

The feeding value of samples of the same grade is about the same for the same class or race of corn, no matter where it was grown. If the corn is in the ear, its quality is readily determined on sight. The quality of shelled corn is not quite so evident. As a rule, any sample of the same general class of corn that shows a good weight per measured bushel is of good quality, and about equal nutritive value.

The following table will give you some interesting chemical information. The Station has made no tests of the value of different samples of corn in practical feeding:

COMPOSITION OF CORN KERNELS—AVERAGE.

Class of corn.	Total dry matter.	Protein.	Fat.	Nitrogen, free extract.	Fiber.	Ash.
Dent, 77 analyses.....	89.9	10.3	5.1	70.6	2.2	1.5
Flint, 63 analyses.....	88.9	10.6	5.0	70.0	1.7	1.4
Sweet, 24 analyses.....	91.4	11.7	8.3	66.5	2.8	1.9
Oats, 21 analyses.....	89.3	11.3	5.0	61.0	9.0	3.0
Wheat, 300 analyses.....	89.5	11.8	2.1	71.9	1.7	1.8

WELLINGTON, O., July 24, 1885.

W. S. Devol:

DEAR SIR: * * * * I send you to-day four specimens. Nos. 1 and 2 are new weeds, the first I ever saw. I found No. 1 in a newly seeded clover meadow, and No. 2 on river bottom. No. 3 is very common, growing in pastures and on hill-sides. It lies flat on the ground like purslane; I don't think stock ever eat it. No. 4 grows on river and creek bottoms. It is 4 to 6 feet high, in clumps of 4 to 8 or 10 stalks; also found in pastures and fence corners, in many places growing so thick as to cover up and nearly smother the grass; it has a large hard root, covered with small lateral roots. It is hard to dig up, and very difficult to kill except by digging out. A great nuisance and spreading.

Very truly yours,

E. W. HOUGHTON.

ANSWER.

Names of the four specimens of plants sent me are as follows :

No. 1—Bearded Plantain, *Plantago aris'ata*, Mx.

No. 2—St. Johnswort, *Hypericum perforatum*, L.

No. 3—Euphorbia or Spurge, *Euphorbia maculata*, L.

No. 4—Actinomers, *Actinomeris squarrosa*, Nutt.

Concerning No. 1, see our Third Annual Report, page 169. No. 2 has been for many years regarded as a very pernicious weed in Eastern United States, and like others of the same class of plants is moving westward; it is a hardy perennial, soon over-running neglected fields. No. 3 is a native of the United States, and is common in gravelly soils and in roadways little used; it is not thought very troublesome. No. 4 is seldom regarded a bad weed, as it seldom advances into cultivated fields. It prefers rich and rather wet soils. Mowing several times a season usually destroys it.

ASHTABULA, O., February 1, 1885.

Prof. W. R. Lazenby:

DEAR SIR: Have you at hand, or can you make an analysis, showing the feeding value of the Hubbard squash?

I raised about an acre and one-eighth of squash last year, in amount, about 14 tons. I did not keep an account of the expense, but would say that it was less than the cost of raising the same amount (in land) of corn. I sold about two tons, and as there was no market for the rest I fed them to my cattle and I think with very good results. First, in increasing the flow of milk from the cows, in adding to the richness of it and in giving a very fine aroma to the butter and making it a nice yellow, equal to June butter. I also fed to three head of stock that were fattening and they gained very fast, indeed, but as I had no scales with which to weigh them, I could not tell how fast. A couple of calves, also to which I gave a few, grew beyond all precedent, so that I am convinced that there is great feeding value in them and shall try a larger field of them this season, and if desirable, will report the result.

I might give some few figures but do not know as they would be of interest to you, as my experiments were not exhaustive enough to form any sufficient test as to the exact amount gained by feeding the squashes.

I am looking quite anxiously for your report and hope to receive it as soon as published.

Yours very respectfully,
J. S. SILL.

ANSWER.

The only record I have of squash analysis is one published in the Connecticut Agricultural Experiment Station Report of 1884. This is as follows, and for sake of comparison, I also append analysis of beets (Mangolds).

	Total dry matter.	Protein.	Fat.	Nitrogen free extract.	Fiber.	Ash.
Squash,	5.12	.66	.28	3 24	.34	.40
Beets (Mangolds),	7.96	1.70	.20	4.19	.82	1.05

While the Station has made no practical tests of the feeding value of the Hubbard squash, I know it to be a cheap and valuable stock food. When in charge of the Horticultural Department of Cornell University, I kept an accurate account with one half acre of Hubbard squashes and found that the crop cost a trifle less than \$3.00 per ton.

TREASURER'S REPORT.

J. C. STEVENS IN ACCOUNT WITH OHIO AGRICULTURAL EXPERIMENT STATION.

RECEIPTS.

From State Treasurer.

Balance on hand March 7, 1885.....	\$1,738 41
Appropriation for 1886—current expenses.....	5,000 00
" " new building	1,000 00
Total.....	\$7,738 41

* DISBURSEMENTS.

Current Expenses.

Salaries.....	\$1,820 00
Labor	1,973 62
Equipment, merchandise, implements, etc.....	1,081 35
Postage, printing and stationery.....	339 07
Express and freight charges	57 99
Expenses of Board and officers	204 60
Total.....	\$5,476 63

Building Fund.

Lumber	\$530 87
Stand and sand.....	75 73
Stone mason	39 70
Mill work	47 76
Carpenter work.....	188 00
Plans	25 00
Hardware and tin work	92 94
Total.....	1,000 00

Total expenditures.....	\$6,476 63
Balance on hand.....	\$1,261 78

MEMORANDUM.

This statement covers the expenditures from March 7, 1885, to March 15, 1886. The current expenses to the close of the year (May 1st) will entirely exhaust the balance on hand. The salary of the chemist and the expense of distributing the Annual Report must come from this balance, leaving scarcely enough to pay the usual labor account.

The smallest amount usually appropriated to any experiment station in the United States, excepting that of the State of Ohio, is \$8 000.

In order to successfully carry out for another year the work now fully inaugurated at the Ohio Agricultural Experiment Station this sum is required.

J. C. STEVENS,
Treasurer.

EMMETT MIX,
W. N. COWDEN,
Auditing Committee.

Acknowledge the receipt of this, if you wish subsequent reports.

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